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DEPARTMENT OF THE ARMY FIELD MANUAL

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NIGHT OPERATIONS

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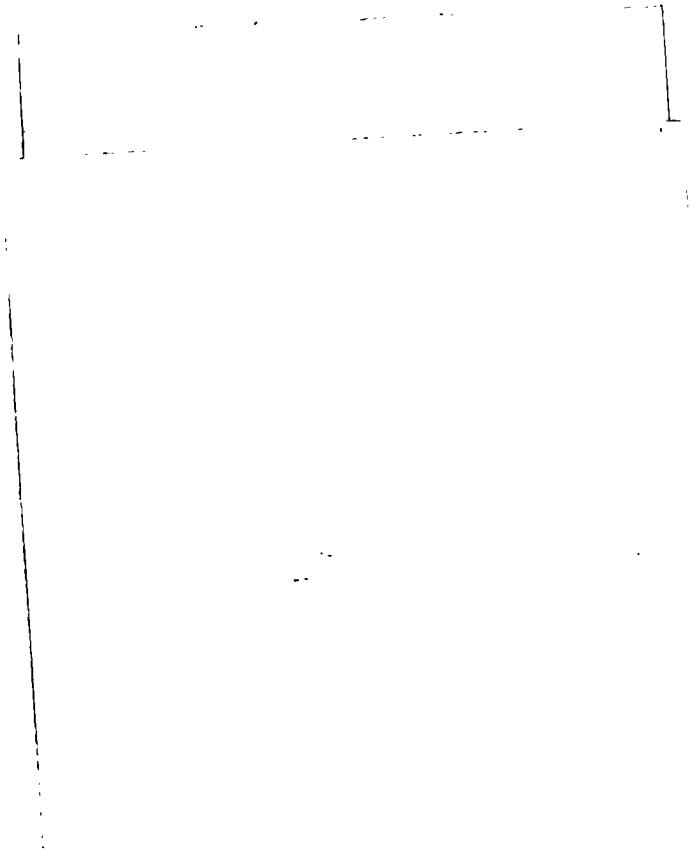

FIELD MANUAL
No. 31–36 (TEST)

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., *12 April 1968*

NIGHT OPERATIONS

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PART ONE
INTRODUCTION TO NIGHT OPERATIONS
CHAPTER 1
GENERAL

1-1. Purpose
The purpose of this manual is to provide interim doctrinal guidance for commanders and staffs in the employment and support of infantry, airborne infantry, airmobile infantry, mechanized infantry, and armor units in night operations for each echelon at battalion level and below.

1-2. Scope
a. This manual prescribes current policy, doctrine, and procedures for conducting night operations with principal emphasis upon Southeast Asia.

b. The material presented herein is applicable to—

(1) General war, to include a consideration of the employment of and protection from nuclear munitions and chemical, biological, and radiological agents; and operations in nuclear, chemical, or biological environments.

(2) Limited war.

(3) Cold war, to include stability operations.

c. This manual should be used in conjunction with the field manuals listed in appendix A.

d. New and improved night operating aids are continually being developed to enhance the Army's capability to fight at night; therefore, as the capabilities and availability of the equipment described herein change, *commanders and small-unit leaders* must adapt the *tactics and techniques* described herein to fully exploit these improvements.

1-3. Night Operations
Night operations include all military activity (attack, defense, retrograde, movement, combat support, and combat service support) conducted at night. Operations in other conditions of reduced visibility require the use of many of the technqiues of night operations. Night operations are undertaken for four fundamental reasons as follows:

a. To attain the initiative by continuing to fight or breaking contact at the most advantageous time and place.

b. To exploit the advantages of darkness, to achieve surprise, and to avoid heavy losses which might be incurred in daylight operations over the same ground.

c. To compensate for advantages held by an enemy with superior forces or air superiority.

d. To counter or neutralize the enemy's night operating capability.

1-4. Fundamental Considerations
Night operations, regardless of the scale on which they are conducted, basically depend on the ability of the individual soldier to perform his assigned task at night. Heretofore, combat associated activities, such as rest, movement, and preparation for coming combat, predominate during hours of darkness and night combat was treated as a special operation because of individual limitations. The degree to which these limitations can be offset or removed is based almost entirely on how much added ability is gained by the proficient employment of night operating aids such as battlefield illumination, night vision devices, sound ranging sets, anti-intrusion devices, radars, and aerial surveillance equipment to accomplish assigned tasks. Fundamentally, these tasks require the soldier to move, observe terrain, and observe enemy and friendly units; aim and fire weapons while observing

their effects; communicate; and perform other tasks associated with the unit's mission. Depending upon the circumstances under which they are employed, the use of night operating aids during the hours of darkness will improve some tactical capabilities more than others. These devices should be employed to best facilitate the accomplishment of an individual task or unit mission. In areas such as Southeast Asia, where the enemy avoids daylight contact and prefers to fight at night, night operating aids improve the effectiveness of night operations.

1–5. Terminology

A glossary of night operations terminology is included in this manual. In addition, those terms which are repeatedly used in this manual are also explained in the text.

1–6. Equipment Appendixes

Because of the variety of night vision equipment and devices used in night operations, separate appendixes are included describing each of the major items of equipment or devices. See the table of contents for a list of this equipment and these devices.

1–7. Recommended Changes

Users of this manual should submit recommendations to improve its clarity and accuracy. They should key comments to the specific page, paragraph, and line of the text in which they recommend a change. Users should provide reasons for each comment to insure understanding and complete evaluation. Users should forward comments direct to the Commanding General, U.S. Army Combat Developments Command, Fort Belvoir, Virginia 22060.

CHAPTER 2
THE NIGHT ENVIRONMENT

Section I. GENERAL

2–1. General

a. Illumination levels at night directly affect the selection of courses of action for the conduct of night operations. Night operations should be conducted when light levels provide maximum advantage to friendly units with night vision devices. Night vision devices which do not use artificial illumination (passive devices) increase night vision under most illumination levels. Under very low illumination levels infrared (IR), pink, or visible illumination can be used in conjunction with night vision devices to improve an individual's capability to see. Use of these illumination sources (active systems) have disadvantages in that the infrared and pink light systems have a signature effect and may be detected by an enemy equipped with infrared devices. Also, visible artificial illumination often aids the enemy as well as the employing force.

b. From a visibility viewpoint, night operations should be conducted at those times when the difference in visual capability between friendly and enemy forces is greatest and in favor of friendly units. When conducting night offensive operations against an enemy not equipped with night vision devices, the preferred illumination level is less than that provided by a full moon on a clear night. This level provides the greatest difference in visual capability between friendly forces equipped with night viewing aids and an enemy without these devices. As a guide, night attacks are best conducted under an illumination level equivalent to that afforded by a quarter moon in a clear sky.

c. Fog, haze, precipitation, smoke, and dust reduce human vision *even* when aided by night viewing devices. These conditions provide varying degrees of concealment from ground and air observation and normally favor an attacker regardless of whether or not the defending force is equipped with night viewing devices. Night attacks by friendly forces under these conditions cannot fully exploit the capabilities of night vision aids. Clear nights will enable units equipped with night vision devices to operate with near day efficiency against forces which are not equally equipped.

d. On the whole, where the night vision capability of two forces is equal, relatively good night visibility favors the defender by permitting him to observe the approach of the enemy and to allow the bringing of fire upon him with maximum effectiveness.

2–2. Twilight

a. Twilight is transition from day to night (dusk) and from night to day (dawn). The beginning of morning nautical twilight (BMNT) and the end of evening nautical twilight (EENT) are the beginning and end respectively, of enough light for limited visibility without the use of night viewing equipment. The beginning of morning civil twilight (BMCT) and the end of evening civil twilight (EECT) are the beginning and end, respectively, of enough light from the sun for daylight operations.

b. During twilight, more light is received from the sun than from the nocturnal sources such as the moon and the night sky even though the sun is below the horizon. This is because of the scattering of the sun's rays by the earth's atmosphere. True night is the condition when no light is being received from the sun other than that reflected by the moon and planets. In general, anywhere on earth

and anytime during the year, the length of true night is about 3 hours less than the time interval between sunset and sunrise.

2-3. Sources of Natural Night Illumination

a. General. In the absence of all artificial lighting (direct or scattered), there are two sources of natural illumination at night, moonlight and the light of the night sky. They differ in both quality and quantity. The night sky provides only one ten thousandth (10-4) of a candle of illumination, whereas on a clear night the total illumination received on the earth's surface from both the moon and the night sky is about one hundredth (10-2) of a foot-candle. One foot-candle is the level of illumination that is produced on a normal surface by a candle at a distance of one foot. One hundredth of a foot-candle (full moon) is relatively high for an individual using a starlight scope. At this level, he can see targets and terrain well at distances outward to the effective ranges of his individual weapon and farther with the crew served weapon sight. As the level of illumination decreases (e.g., from full moonlight to quarter moonlight), so does the viewing distance of image intensifying devices. The relationship between foot-candles and other commonly accepted units, such as twilight or moonlight is shown on figures 2-1 and 2-2. On the 40° North Latitude Line it is seen that a full moon level corresponds to about one-hundredth of a foot-candle and that a quarter moon provides about one-thousandth of a foot-candle of illumination.

b. Light of the Night Sky. Light of the (moonless) night shy is a comparatively low, but significant source of illumination. In order of importance it is made up of airglow, starlight, and zodiacal light. About three-fourths of the light of the moonless night sky comes from airglow. Airglow is composed of light emissions from various chemical elements in the high atmosphere above 70 kilometers. Light reaching the earth from the visible stars comprises 10 to 15 percent of the moonless night sky. About the same amount of light is provided by the zodiacal light, which is a faint scattering of sunlight from cosmic or interstellar dust particles. The intensity of the total light of the night sky (airglow, starlight and zodiacal light) is about one-ten-thousandth of a foot-candle on a clear night or only about one-hundredth of that received from the full moon. The first generation of passive night viewing devices (devices which do not use artificial illumination) is not as effective when light from the moon is absent. In general, viewing distances are reduced. However, they still afford a great visual advantage over an enemy not equipped with such devices. In many instances, viewing distances may be increased by providing very small amounts of artificial illumination from either searchlights or flares. In any case, a great visual advantage over the enemy is obtained by using night vision systems even under minimal moonless night sky illumination conditions.

c. Moonlight. Moonlight is the most important source of night illumination in terms of intensity. The moon, reflecting light from the sun, approximates a point source of illumination. By greatly multiplying the amount of existing illumination, passive night vision devices are very effective under moonlight conditions.

Section II. NIGHT VISION CONSIDERATIONS

2-4. Unaided Night Vision

Dark vision, or the ability to see unusually well under very reduced levels of illumination, can be achieved by allowing little or no light to enter the eye for a period of approximately 30 minutes. During this period chemical changes occur within the eye which cause the eye to become unusually sensitive to small amounts of light, and therefore, an individual with dark vision can see well even in poorly illuminated areas. Dark vision is rapidly destroyed by exposure to normal and bright light levels and consequently as a practical matter, the individual soldier on the battlefield cannot acquire and preserve maximum dark adapted vision. Therefore, the individual soldier usually can see only to the extent normally possible without benefit of dark adapted

vision. Infrequently, such as on patrols where burning and exploding incidents are not encountered, individual soldiers may achieve a higher than normal degree of visual acuity at night. Under these circumstances, the individual soldier should avoid looking at all light sources, if possible. When not equipped with night vision devices, off-center vision and scanning observation procedures should be practiced, since off-center vision is more sensitive at low illumination levels.

2–5. Length of the Night

a. Anywhere on earth throughout the course of the year exactly one-half of all hours are hours of relative darkness. Except at the time of the equinoxes when daylight and night everywhere equally divide the day, day and night are of unequal length. The length of the night (or day) at any spot on earth is a function of the latitude of that place and the time of year (figs. 2–1 and 2–2). The night is always 12 hours long at points on the equator and generally varies only a little more than an hour during the course of the year within the tropics near the equator. The variation in the length of the night is considerable in the middle and high latitudes.

b. For approximately half of the nighttime hours of any month in the midlatitudes, the only natural source of nocturnal illumination is the light of the moonless night sky. Referring to figure 2–2 it is seen that full moon levels prevail only about 30 percent of the time at middle latitudes in July and that light from the (moonless) night sky with reduced levels of illumination can be expected approximately 25 percent of the time.

2–6. The Effect of Overcast

a. Overcast can reduce light levels by a factor of 2 for thin overcast to a factor of 10 for dark, heavy storm clouds. For example, in the latter case, the ambient illumination level on a night with a heavy overcast will be only one-tenth of that available on a clear night.

b. The effect of overcast on the light of a full moon is not significant compared to the much greater fluctuation caused by the moon's elevation above the horizon and its phase such as a quarter moon or half moon. Heavy overcast tends to diffuse moonlight; softening high contrast and filling in shadows somewhat. The effect of heavy overcast on the light of the moonless night sky is much more pronounced because of the much lower levels of illumination.

Section III. TRAINING

2–7. General

Training for night operations is necessary to increase the capability of the individual soldier and his unit to accomplish their missions. This training should include night operations with and without night operating aids.

2–8. Individual Training

Individuals should receive training with the night operating aids with which they will be equipped or with which they will be responsible for operation. These include all the night operating aids discussed in chapter 3 and described in appendixes B through AE. This training should include techniques of operation, employment, and maintenance. Some of the applicable field manuals, technical manuals, and training circulars for use in such training are listed in appendix A.

2–9. Unit Training

When the soldier has attained proficiency with the night operating aid with which he is equipped, the coordinated use of these aids should be practiced at unit level. As an example, employment and control of individuals using night vision sights for both individual and crew served weapons in an infantry company should be practiced at squad, platoon, and company level.

2–10. Field Exercises and Maneuvers

During field exercises and maneuvers, combined arms forces, with supporting combat support and combat service support elements, employ night operating aids during night operations. Operating with a night visibility play (NVP), the force commander coordinates the employment of all night operating aids.

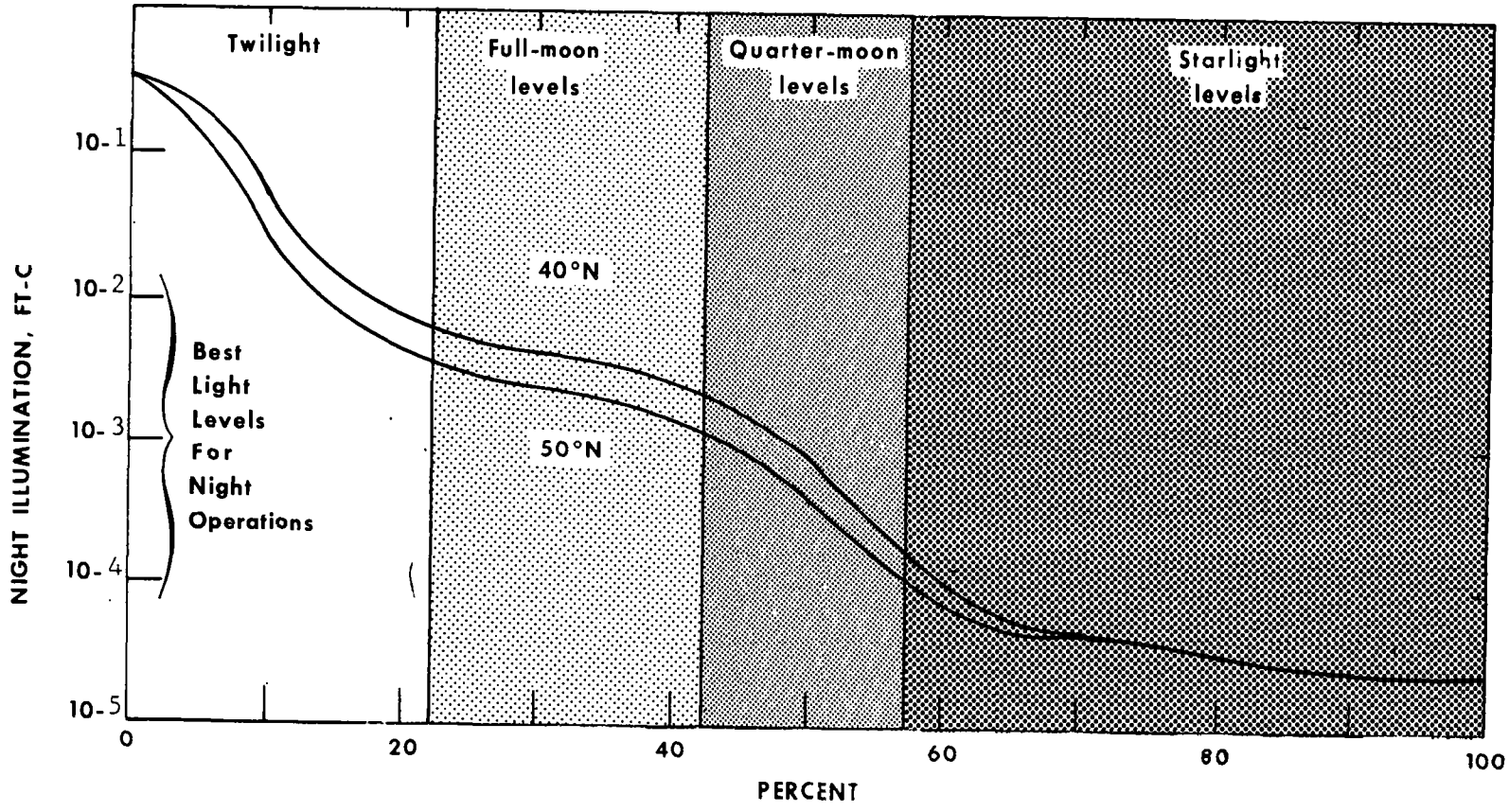


Figure 2–1. Illumination levels: percentage time equal to or exceeded in January for Northern Hemisphere.

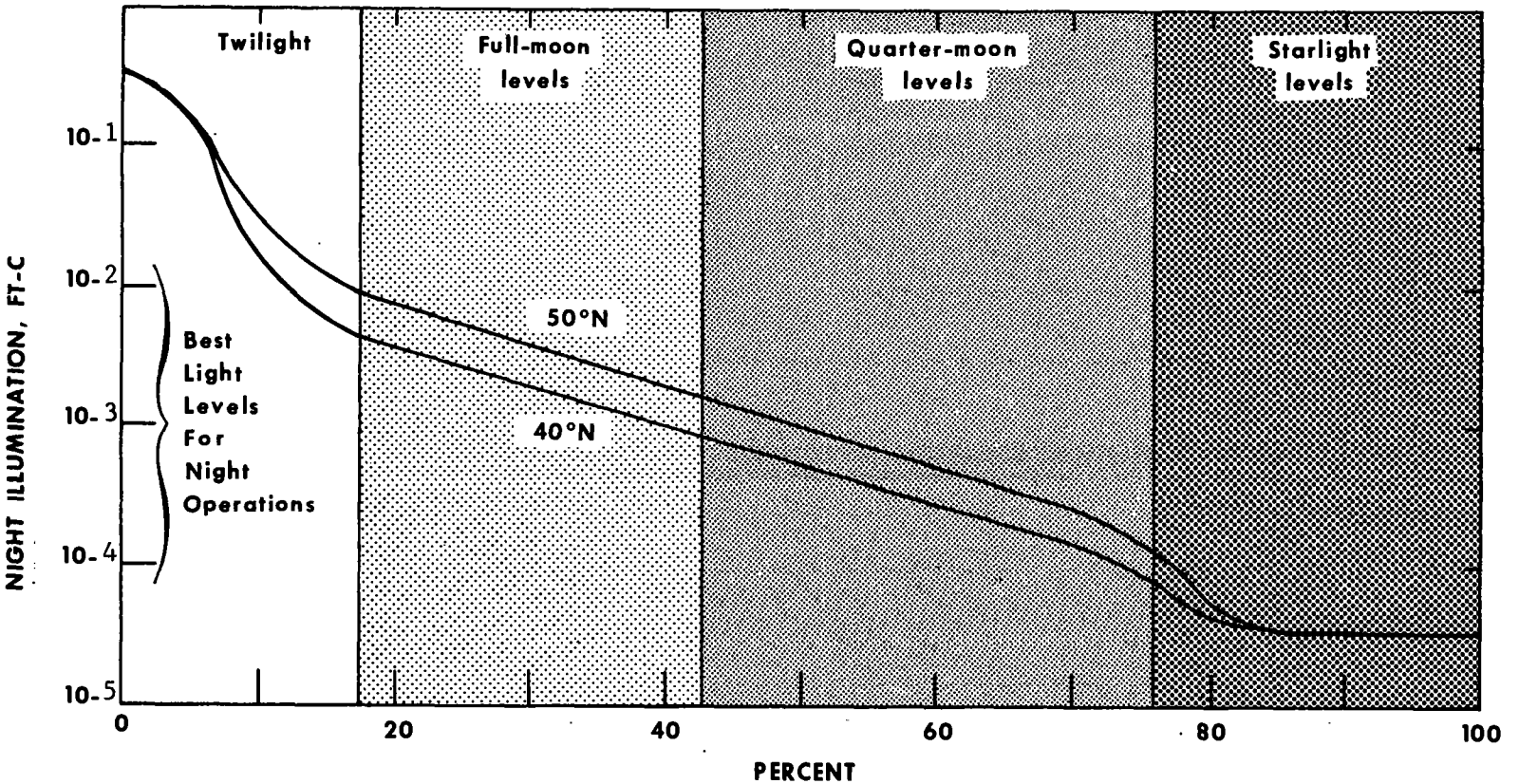


Figure 2–2. Illumination levels: percentage time equal to or exceeded in July for Northern Hemisphere.

CHAPTER 3
ILLUMINATION, NIGHT VISION, AND COMBAT SURVEILLANCE

Section I. PLANNING

3–1. General

a. Combat surveillance is a principal means by which enemy objects and activities are detected. It encompasses all techniques of accomplishing a continuous (all weather, day and night) systematic watch over the battle area to provide timely information for tactical ground combat operations.

b. Ground surveillance is the primary means of obtaining the essential information necessary to conduct operations in the battle area. It is characterized by line of sight limitations and is dependent upon terrain for movement routes and site locations. In addition, ground surveillance must be effective during all weather conditions, day or night.

c. Aerial surveillance requires the use of an aerial platform to extend the line of sight capability of ground surveillance. The capability of conducting surveillance missions over large areas is enhanced by the aerial surveillance platform's mobility and ability to carry various combinations of electronic sensor equipment currently within the Army inventory. Generally, visibility restrictions and inclement weather reduce the effectiveness of aerial surveillance. Problems of coordination and control of the use of airspace may impose further limitation on the use of aerial surveillance. In or near the FEBA, mission requirements, along with the capability and limitation of the sensor equipment, may preclude the aircraft from utilizing established airways.

d. Without the capability for night surveillance, the commander is severely handicapped by his unit's limited ability to move, shoot, perform reconnaissance, or acquire targets. Current illumination, and night vision and surveillance aids, increase the capability to perform the fundamentals of combat during periods of limited visibility. These aids provide the ability to exploit the advantages of darkness while surpassing and countering the enemy's capabilities to operate at night. The following sections summarize the available illumination, night vision, and combat surveillance aids common to or available to support the maneuver battalion. Technical characteristics, capabilities and uses are found in appendix B through AF.

3–2. Requirements

The principal requirement for night vision aids is to overcome the limitations imposed on friendly forces by low light levels. These aids should be used in such a manner as to give maximum assistance to friendly forces while impeding the enemy, or giving him as little assistance as possible. The requirements for night vision originate with those of an individual, a patrol, or a squad and progress in increasing magnitude to the requirements for the battalion. These requirements are to—

a. Produce a night vision advantage for friendly troops.

b. Detect, identify, and engage enemy elements within the friendly unit's area of influence.

c. Enable aircraft to perform their mission during darkness to include helicopter direct fire support and tactical close air support.

d. Enable combat support and combat service support operations to be carried out more effectively during darkness.

e. Enable mounted and dismounted troops to move and navigate during darkness with near daylight speed and accuracy.

f. Detect enemy ambushes and increase the

effectiveness of friendly ambush operations during darkness.

3–3. Planning

a. Night Visibility Plan (NVP).

(1) To achieve a near-daylight capability to move, fight, and acquire targets during darkness, a night visibility plan is prepared. It coordinates the use of all night vision aids, illumination means, and surveillance devices available. The night visibility plan reflects the commander's concept on how these aids will be employed. It contains specific orders and instructions concerning the use of visible illuminants, infrared light, infrared viewers, passive night vision devices, radar, incendiary munitions, and the effect of nuclear fires on night operations.

(2) The NVP includes means for employing available illumination (visible and invisible) even if the attack plan calls for the objective to be seized by stealth. The type of illumination planned depends on the degree of secrecy the unit will try to maintain and the amount of additional visible light or infrared light needed to conduct the attack. The maneuver unit commander retains authority for initiating illumination. It may be direct or indirect; visible or invisble. Extreme care must be exercised not to render viewing devices ineffective by friendly visible illumination in proximity to friendly troops. Visible illumination must be coordinated with adjacent units and higher headquarters as appropriate.

(3) The formality of the NVP varies with the echelon of command within the major unit conducting the operation and the time available for planning. At company and battalion level the plan consists of how to best use attached and organic night vision aids within the restraints, if any, imposed by higher headquarters. Many elements of the NVP may be incorporated into the unit SOP. The NVP at battalion level does not normally exist as a formal plan; however, restrictions by higher headquarters on the use of night vision devices would be contained in the unit operation order as appropriate.

b. Coordination. The night visibility plan must be fully coordinated with the overall plan of maneuver and fire support, as well as the intelligence gathering and target acquisition efforts at all levels. The night visibility plan must also be coordinated at all levels to insure that operations of adjacent units are not compromised.

Section II. BATTLEFIELD ILLUMINATION

3–4. General

Battlefield illumination is the lighting of an area of operations of combat, combat support, and combat service support units by artificial means. In stability operations it includes the illumination of any area as a security measure. A detailed discussion of illumination employment, characteristics, and capabilities is found in FM 20–60.

3–5. Purpose of Battlefield Illumination

The purpose of battlefield illumination is to provide sufficient light for friendly forces to conduct operations during periods of darkness. Proper use of illumination means permits more effective execution of night offensive and defensive operations; makes possible better coordination and control of attacking elements; facilitates the organization of defensive positions and the conduct of the defense; permits maintenance, repair, recovery, and equipment evacuation; and promotes troop confidence and morale. The employment of illumination is favorable for nuclear-supported night attacks because the consideration of secrecy is normally eliminated by the nuclear attack, and the use of illumination will facilitate a more rapid exploitation.

a. In the offense, illumination is used to assist—

(1) Patrols in night reconnaissance and in diversionary activities to cover such operations.

(2) The advance of troops by providing light which assists in maintaining direction, terrain orientation, and control of troops.

(3) In the effective siting of close support weapons, particularly in unfavorable terrain.

(4) The detection and breaching of minefields and the reduction of other obstacles.

(5) The night movement of combat support elements.

(6) The handling and servicing of weapons and vehicles of all types.

(7) The embarking, debarking, and control of bridging and river-crossing operations.

(8) The attainment of more distant objectives by increasing control of the operation.

(9) In silhouetting an enemy position which is being attacked from a flank or to blind the enemy in his defensive positions.

(10) Deception efforts, such as the illumination of a rear area or a river-crossing site, to deceive the enemy as to the true area of operations or crossing site.

(11) Airstrike effectiveness by illuminating the objective.

(12) On site repair, recovery, and evacuation of materiel.

(13) Shore party operations during an amphibious operation when the beachhead has been secured.

b. In the defense, illumination is used to facilitate—

(1) The organization of defensive positions by aiding reconnaissance; permit more effective siting of direct fire weapons and adjustment of indirect fires; and facilitate the laying of minefields, erection of wire, construction of obstacles, and the digging of foxholes and emplacements.

(2) The early detection and the blinding of an attacking enemy, and the placing of effective fire on that enemy to produce psychological as well as physical effects.

(3) The promotion of confidence in troops holding defensive positions at night.

(4) The discouragement of enemy patrol action, infiltration, and night attacks.

(5) The conduct of night counterattacks.

(6) Communication by providing light to assist wire crews in laying, maintaining, or recovering wire lines; and assist messengers in finding routes to their destinations.

(7) The tactical and administrative movement of troops and vehicles.

(8) The location and evacuation of casualties.

(9) Displacing, handling, and servicing of weapons and vehicles.

(10) On site repair, recovery, and evacuation of material.

(11) Search and rescue operations by providing light to locate and/or recover individuals or groups isolated or separated from their parent organization in friendly or enemy territory.

(12) The security of critical installations where the primary threat is from infiltration and/or ground attack rather than air or artillery action.

3-6. Principles of Battlefield Illumination

a. Battlefield illumination in support of friendly forces is provided in the required intensity wherever and whenever needed. Battlefield illumination frequently is the critical factor in influencing the course of battle in favor of the friendly troops. On the other hand, insufficient battlefield illumination may result in the failure of friendly troops to accomplish their tactical mission.

b. The employment of an illumination means is the responsibility of command, and is in accordance with the NVP. The decision to employ illumination (types, means, degree, and area) must be made by the commander after he considers the effects that the illumination of one area will have on the operation of a unit in an adjacent area.

c. Wherever possible, a means of illumination that gives maximum advantage to the user is employed. Each unit requiring illumination must have sufficient means available to accomplish the illumination mission until it can be taken over by a higher echelon. Where possible, illumination should be provided by the highest echelon practicable. The purpose of this principle is to conserve the illuminants available to lower echelons so that the lower echelons will be prepared at all times to meet emergency requirements for illumination. Accordingly, battlefield illumination is provided by searchlights, airborne illumination systems, and aircraft flares wherever and whenever practicable.

d. Artillery illuminating shells must be available for delivery to artillery firing posi-

tions whenever needed to insure continuous illumination in the event of failure of the primary illumination means.

e. All battlefield illumination must be included in the night visibility plan and coordinated at the highest level practicable. Such coordination is required because illuminants frequently light areas outside the zone of the using unit and, unless fully coordinated with all elements concerned, may disclose to the enemy the operations of adjacent units. In addition, units planning to employ illumination must directly coordinate such plans with adjacent units affected. Battlefield illumination may be used to increase the effectiveness of image intensification night vision devices when there is insufficient ambient light. However, too much light reduces or eliminates this effectiveness.

f. An alternate means of illumination, such as artillery illuminating rounds, searchlights, airborne illumination systems, and aircraft flares for intermediate area illumination, must always be maintained.

g. Once illumination is commenced, it must continue without interruption until the need for illumination is satisfied. This type of illumination temporarily eliminates night vision, therefore precautionary measures, such as keeping the eyes closed or using filter goggles, must be taken. About 30 minutes are required for troops to regain dark adapted vision.

3-7. Means of Illumination

a. General. Illumination means available to support night operations are found in the appendixes of this manual.

b. Direct Illumination. Direct illumination is provided by direct light from pyrotechnics or searchlights. The intensity of light provided by direct illumination varies according to the source of illumination. The means available to ground troops for use in direct illumination are—

(1) Ground signals.
(2) Illuminating grenades.
(3) Trip flares.
(4) Artillery illuminating shells.
(5) Mortar illuminating shells.
(6) Naval illuminating shells.
(7) Aircraft flares (Army and AF).
(8) Artillery searchlights.
(9) Tank searchlights in the infrared or visible light modes.
(10) Heliborne searchlights.

c. Indirect Illumination. Indirect illumination (artificial moonlight) is a type of battlefield illumination obtained by employing artillery or tank searchlights using diffusion or reflection techniques.

3-8. Factors Involved

a. No one means of illumination is effective or suitable under all circumstances. The following factors influence the suitability, effectiveness, and tactical employment of illumination means:

(1) Enemy and friendly situation.
(2) Purpose or use of the illumination.
(3) Number and characteristics of illumination means available.
(4) Time available for planning and preparation (urgency of the need for illumination).
(5) Requirements for security of the illumination means.
(6) Size of the area to be illuminated.
(7) Range to the area or target to be illuminated.
(8) Duration of time the area is to be illuminated.
(9) Terrain, vegetation, and structures.
(10) Weather and atmospheric conditions.
(11) Vulnerability of available illumination means to enemy countermeasures.
(12) Economy of available means.
(13) Communication between the supporting and supported unit.

b. All means of illumination must be considered in planning their employment. The use of one or more satisfactory means may be negated by such factors as enemy action; changing weather and atmospheric conditions; terrain, vegetation, or structures; necessity for employing all organic weapons on missions other than illumination; failure of the illumination device itself; or lack of logistical support.

Section III. NIGHT VISION DEVICES

3–9. General

This section discusses the night vision devices which are available to the individual soldier. The two types currently available are active (infrared) and passive (image intensification) in nature. Characteristics and capabilities of these items are discussed in the appendixes of this manual.

3–10. Active (Infrared) Devices

These devices use infrared (IR) illumination to provide a capability for night viewing regardless of the level of ambient light. Filtered white light from flashlights and searchlights can provide the required infrared light. These include—

a. Infrared weapons sight (app H).

b. Image metascope (app D).

c. Electronic binoculars (app C).

d. M–18 infrared binocular (tank kit) (app F).

e. M–32 infrared periscope (tank kit) (app E).

f. M–24 infrared driver's periscope (tank kit) (app AE).

3–11. Passive (Image Intensification) Devices

These devices intensify ambient light levels to provide visible images. Starlight and moonlight ordinarily provide sufficient light to employ these devices. Artificial illumination at low intensity increases their effectiveness during particularly dark periods. Direct or bright artificial illumination renders these devices temporarily ineffective. Image intensification devices generally provide a surveillance capability at greater ranges than infrared equipment. Current image intensification devices include—

a. Miniscope (lightweight for individual soldier) (app AC).

b. Starlight scope (small arms weapon sight) (app G).

c. Crew served weapons night vision sight (app I).

d. Night vision sight, tripod mounted (also known as the NOD) (app J).

3–12. Employment

The following aspects of night operations are improved by the proper use of night vision devices:

a. Intelligence. The devices increase long range visual reconnaissance, surveillance, and target acquisition.

b. Mobility. Infrared binoculars with infrared filtered headlights facilitate movement of vehicles under blackout conditions. Night vision weapons sights can be handheld to improve the dismounted capability to move at night.

c. Firepower. Individual and crew served weapons night vision sights improve the capability of the individual to aim and to engage the enemy at ranges beyond the detection range of the unaided eye. These devices also aid in reducing the dangers of being ambushed or being engaged in an unexpected close-in firefight.

d. Command, Control, and Communications. Night vision devices improve means of exercising control at night. These devices can be used for signalling, marking unit positions, and identifying control measures.

3–13. Capabilities

Night vision devices increase the effective range of the eye at night. These devices provide the following advantages:

a. Infrared light used to illuminate a target area normally cannot be detected by the unaided eye beyond ten meters from the light source.

b. Night vision devices can be used to detect the enemy's use of infrared light.

c. Image intensifier night vision devices do not require an artificial light source. Therefore, these devices cannot be readily detected.

d. On moonless nights when illumination from the night sky is not adequate, image intensification devices may be used effectively by providing small amounts of artificial illumination such as diffused light from searchlights.

e. Night vision devices for weapons can be dismounted and handheld for other than

weapon sighting purposes such as general surveillance.

3–14. Limitations

By improper use, employment of some night vision devices can be detected. Operators of these devices must be thoroughly familiar with the appropriate technical manual for equipment limitations. Such detection by the enemy may disclose friendly positions, and also may compromise the overall plan of operation. Some of the major limitations are—

a. Infrared light can be detected and the source located. Infrared light is subject to countermeasuring by physical means (e.g., IR-Detector aided fire) by chemical smokes or by counterillumination.

b. Night vision devices are line of sight instruments. Dead spaces in surveillance, experienced during the day, are generally the same at night. Some night vision devices are adversely affected by bright light.

c. All night vision devices are adversely affected by bad weather conditions. If the objective lens get fogged or wet, the image will be distorted.

d. For best operations, image intensifier devices require clear moonlight and night sky conditions. Infrared devices require clear, dark conditions for best operations.

e. Prolonged use of night vision devices produces eye fatigue.

f. The use of night vision devices must be closely coordinated with active means of battlefield illumination. Artillery and mortar illuminating rounds, and searchlights can render night vision devices inoperative or severely limit their capabilities.

Section IV. SOUND RANGING

3–15. Sound Ranging Set, GR–8

Sound ranging is the procedure used to locate the source of a sound wave by measuring the relative times of arrival of the sound wave at several accurately located microphones. The GR–8 Sound Ranging Set (app U) has proved to be a productive target acquisition means for locating hostile artillery, registering and adjusting friendly artillery, and collecting battlefield information. Sound ranging locates hostile artillery pieces which are hidden from visual observation. It is a passive device, not subject to electronic countermeasures. It is very effective during periods of reduced visibility, since it does not require visual observation of the target. On the other hand, mountainous terrain materially affects operations, depending on the relative locations of the base and sound sources and the ground contours of the area under surveillance. Heavy firing by friendly artillery tends to confuse interpretation of the sound record. High wind conditions lessen the effectiveness of sound ranging because of distortion.

3–16. Employment

The sound ranging set is normally found in the sound ranging platoon organic to the field artillery target acquisition battalion. A detailed discussion of the tactics and techniques of employing the sound ranging set is found in FM 6–121.

Section V. ANTI-INTRUSION DEVICES

3–17. General

Anti-intrusion devices are intended to provide a warning of intrusion into a specific area without the intruder being aware of detection. The two devices currently available are the AN/GSS–9 breakwire device and the AN/PSR–1 seizure device.

3–18. AN/GSS–9, Alarm Set, Anti-Intrusion Device

This device (app V) is intended to provide protective surveillance by producing an audio or a light alarm to indicate intrusion into an area or passage through selected lines. The breakwire alarm provides an audio or a light

alarm when the detector wires are broken by an intruder. Operational techniques are discussed in TM 11–63530–200–10.

3–19. AN/PSR–1, Intrusion Detecting Set

This device (app W) is capable of detecting any minute earth movement which can be caused by human footsteps, vehicles, aircraft or any similar disturbance. It may be submerged or laid in tunnels or in buildings. Since it is a seismic device, the intruder need not make contact with wires or other sensors. However, friendly personnel and equipment operating in the area reduce its eflectiveness and range.

Section VI. RADARS

3–20. General

Ground surveillance radars and counterbattery radars are active devices subject to electronic countermeasures and detection. Radars are employed in offensive, defensive, retrograde, and other operatons, both mobile and static. In mobile warfare, radars are employed aggressively to provide a continuous all weather, all light condition capability of detecting enemy activities, controlling friendly movement, and detecting hostile mortar or artillery firing positions. In static situations, positioning is changed periodically and alternate positions prepared to neutralize enemy detection and countermeasures. Use of available radar is coordinated for a complementary surveillance effort. Detailed characteristics and capabilities are found in appendixes N through T.

3–21. Ground Surveillance Radar

These radars have the capability of searching for, detecting, and locating moving targets within the battle area. Since the target is moving, ground clutter such as foliage which restricts visibility, normally do not restrict radar surveillance. Targets may be identified by characteristic audible tones associated with their movement. Ground surveillance radars are employed on vantage points to exploit their surveillance capabilities. Radar sets currently available are—

a. AN/TPS–25A Long Range (Artillery) (app S)

b. AN/TPS–33 Medium Range (app Q)

c. AN/PPS–4 Short Range (app N)

d. AN/PPS–5 Medium Range (Replaces current short and medium range ground surveillance radars.) (app O)

3–22. Countermortar/Counterbattery Radars

The AN/MPQ–4A countermortar radar and the AN/MPQ–10A counterbattery radar are employed by the artillery to detect and locate hostile mortar and artillery positions. A detailed discussion of the tactics and techniques of employing these radars is found in FM 6–121.

a. The AN/MPQ–4A countermortar radar is designed primarily for tactical employment with the direct support artillery battalion. It may be effectively employed in fixed installations in stability operations when the situation dictates. Detailed planning is required to select an appropriate orientation azimuth or position to obtain the area of interest within the limited scan capability of the equipment. If mortar fire is detected from other directions, the radar may be rapidly shifted to the sector of interest. Chapter 5 discusses the countermortar plan in conjunction with available fire support.

b. The AN/MPQ–10A counterbattery radar is a larger and less mobile unit than the AN/MPQ–4A. Normally, it is found organic to the field artillery target acquisition battalion at corps artillery.

Section VII. AERIAL SURVEILLANCE

3–23. General

Army and Air Force observation aircraft, depending on type and equipment, have the capability of performing day and night visual, photographic, radar, and infrared missions. The particular aircraft to be employed for

target acquisition missions is determined by the capabilities and limitations of available aircraft and their sensory devices. The depth into the enemy area to which Army aircraft can penetrate depends on the characteristics of available aircraft and the enemy air defense capability. Aerial surveillance is discussed in FM 30–20.

a. Rotary Wing Aircraft. The design characteristics and lack of stability of the helicopters currently within the Army inventory, preclude the use of heavy electronic sensor devices. Utilization of sensor equipment in present day helicopters is generally limited to an aerial observer and/or a camera.

b. Fixed Wing Aircraft. Army fixed wing aircraft employed in the target acquisition role are light and medium observation aircraft. The medium observation aircraft have a greater range and speed which make them more suitable for target acquisition missions not within the capability of light observation aircraft. Medium observation aircraft are employed primarily to carry sensor devices not adaptable to light observation aircraft.

3–24. Visual Surveillance

Aerial observation provides an important means of target acquisition. It permits locating targets that are in defilade from ground observation and makes observation possible at greater depths into the enemy area. Night observation devices such as the starlight scope increase the capability of aerial observers during periods of limited visibility. Tactical air support aircraft participate in or perform visual reconnaissance missions to assist observers in Army aircraft to detect enemy units, obstacles, ambushes or movement into the area and to provide information on the terrain to be traversed.

3–25. Photography

a. Various aerial cameras with day/night capability are carried in Army and Air Force aircraft.

b. Optical imagery obtained from aerial cameras produces a permanent record of the area observed. A study of aerial photographs discloses recent enemy construction, digging, movement, and other activity not discernible to other means of observation. Targets are identified through interpretation by their size, shape, shadow, shade, and surroundings.

3–26. Radar Surveillance

a. Airborne radar, principally side looking aerial radar (SLAR), produces general intelligence records of terrain presentations and/or indications of moving vehicles. The use of radar imagery for stationary target acquisition is limited. Radar imagery is a map-like presentation showing landmasses, streams and water bodies, and built-up areas such as cities, etc., and can both be viewed in flight and preserved on film. A data-link system also enables a ground terminal to view the imagery while it is being produced and to preserve it on film. Moving target indications reveal densities of activity and traffic patterns. Airborne radar provides acceptable imagery during periods of daylight or darkness and in conditions of light rain, smoke, haze, and dust. Radar is susceptible to enemy electronic countermeasures. However, jamming of the radar is extremely difficult because of its operational characteristics.

b. An image interpreter trained in the techniques of extracting information from radar imagery is desired for interpretation of airborne radar imagery. The agency requesting radar imagery must advise the interpreter of the intelligence requirements for each mission in order to permit rapid detection and dissemination of desired information from the radar imagery. Airborne sensor operators are capable of noting and reporting the locations of moving targets indicated on the imagery display.

3–27. Infrared Surveillance

a. Airborne passive infrared sensors are carried by medium observation aircraft. These sensors provide an oscilloscope presentation in the aircraft for immediate viewing by an observer, or by means of a datalink simultaneously provide a display at ground terminals. The infrared sensor system provides the capability, both in the aircraft and at the ground terminals, of preserving the infrared imagery on film in order to provide both detailed and general imagery records.

b. This imagery provides valuable indications of enemy activities. Therefore, information from infrared imagery must be correlated by target acquisition means which can provide target identification and three-dimensional location in sufficient detail and accuracy to permit effective attack.

c. Airborne passive infrared sensors provide for point target identification, route reconnaissance, and limited area surveillance. These devices are not vulnerable to electronic countermeasures but are susceptible to deception. Rain, hail, smoke, dust, and fog reduce infrared sensor effectiveness; however, through the use of appropriate filters some of these restrictions can be either reduced or eliminated. To make these sensors more effective during daylight operations, they should be used in conjunction with the aerial camera and other appropriate electronic photographic equipment.

3-28. Helicopter Mounted Image Intensification System

The remote view image intensifier mounted on a helicopter can be utilized to an advantage in the role of tactical surveillance and target acquisition, and can be used effectively along rivers, canals, and roads. The minimum ambient light level equivalent to a quarter moon is required for effective operation. This system can be used in conjunction with helicopter fire teams employed on night search and destroy missions.

Section VIII. SIGNAL INTELLIGENCE

3-29. Signal Intelligence and Passive Electronic Coutermeasures

As compared to daylight activities, the enemy may be expected to increase his use of and reliance on surveillance radars and other vision aids, and on use of radio in lieu of visual signals, messengers, or new wire-laying during night operations. Signal Intelligence (SIGINT) and Passive Electronic Countermeasures (PECM) resources available to friendly forces can be exploited to aid in detecting and locating these devices. SIGINT and PECM can provide unique aid through their capabilities for detecting these indicators of enemy locations and activities beyond the range of friendly ground-based night vision aids and radars. Planning for night operations should include consideration of the potential contributions of SIGINT and PECM, and necessary arrangements with appropriate elements for provision of such support.

3-30. Plans

Plans take cognizance of the special vulnerability of both friendly and enemy operations through increased reliance on night vision aids for their success; and the susceptibility of these aids to detection and countermeasuring. Plans include provisions for special security measures to inhibit the probability or alleviate the impact of detection, and special deception measures to capitalize on probable detection. Plans are drawn to avoid catastrophic failure in event friendly night vision aids and communications are put out of action by physical or electronic countermeasures. Plans are made for physical or electronic countermeasures (to include deception) against enemy night vision aids.

PART TWO
COMBAT SUPPORT AND COMBAT SERVICE SUPPORT
CHAPTER 4
COMBAT SUPPORT

Section I. GENERAL

4–1. Introduction
Combat support units are provided to the maneuver battalion as required to assist in the accomplishment of the mission. These units may be organic, attached to, in support of, or under operational control of the battalion or its higher headquarters. This chapter is applicable to those nonorganic units which normally provide combat support to the maneuver battalions.

4–2. Combat Support Elements
a. Organic Elements. The organic combat support elements of the infantry battalion are the ground surveillance section, the communication platoon, the heavy mortar platoon and the antitank platoon. The tank battalion and armored cavalry squadrons have similar combat support less the antitank platoon.

b. Nonorganic Elements. The nonorganic combat support elements normally available to support a maneuver battalion are Army aviation, intelligence, chemical, engineer, artillery, and communication elements. The battalion may also receive combat support from other services such as Naval gunfire, tactical air support, and signal intelligence and electronic warfare resources available to the division or brigade. When gunfire or air support is provided by other services, a forward air controller and/or a naval gunfire liaison officer normally is present to coordinate the support.

4–3. Employment of Combat Support
a. Commanders must employ combat support units to make the maximum use of their capabilities.

b. The four factors considered prior to employment of combat support resources are mission, enemy, terrain and weather, and troops available (METT).

4–4. Specific References
For a detailed discussion of combat support of armor and infantry elements, see the FM 17-Series and the FM 7-Series. A description of combat support functions in night operations is contained in paragraphs 4–5 through 4–38.

Section II. COMMUNICATIONS SUPPORT

4–5. General
a. Tactical commanders at all echelons require reliable, responsive, secure, and flexible communications systems to insure positive command control of their forces. These communications systems must be equally as effective during night operations as during daylight hours to adequately support the fire and maneuver requirements of supported combat elements at any time. The introduction of night vision devices into the Army inventory in no way changes tactical communications doctrine as set forth in FM 24–1. Signal communications organizations, units, and elements are organized and trained to provide a sustained communications capability during day

or night operations. Night vision devices give them the capability of establishing signal communications more rapidly during the hours of darkness and in many cases increase operating efficiency.

b. During night operations, command control of battalions or smaller sized units is more difficult. This is especially true when the maneuver element is in close proximity to an enemy employing hit and run tactics and the means employed to control the maneuver element (signal communications) cannot be displaced rapidly because of darkness. Use of night vision devices by communications personnel provides them with the capability to deploy or displace communications equipment or systems with speeds approaching those achieved in deploying or displacing during daylight hours. Use of night vision devices decreases movement and installation time and increases operating time during night operations.

c. The difficulty of maintaining communications by other means during moving situations at night will tend to result in increased reliance on the use of radio by both friendly and enemy forces. Special attention is required to signal security (SIGSEC) measures designed to minimize enemy SIGINT or PECM exploitation, and to electronic counter-countermeasures (ECCM) designed to reduce the vulnerability of friendly communications to jamming and deception. Planning should also consider the potential for successful low-level manipulative and simulative communications deception at night, when the enemy's capabilities for developing controverting intelligence by other means is inhibited.

4-6. Functional Utilization of Night Vision Aids

Communications equipment and equipment configuration, and the communications systems they provide, vary in size and complexity depending upon the purpose for which they have been designed. For the most part, hours of darkness have an appreciable effect on the operating efficiency of communications personnel utilized in battalion and smaller unit communication systems. However, hours of darkness also affect the installation and maintenance of communications systems at all levels. The functional areas of installing, maintaining, and where applicable, operating communications means (wire, radio, messenger) that are affected by night operations and that require special attention and consideration with respect to the use of night vision aids, are discussed in subsequent paragraphs.

a. Wire Operations.

(1) During night operations, dispersion of units and elements requiring wire communications, and the distances involved to provide this service, impose certain constraints on wire personnel. Some constraints are natural hazards; others are due to enemy action. In either case, they increase the wire system installation time. Reconnaissance of wire and cable routes normally is conducted during daylight hours. Command post wire installation teams and teams providing wire circuits to supported elements are hampered by blackout conditions. These conditions result in delays of telephone instrument installation and installation of wire circuits and interconnecting cables between other types of communications equipment. With the advent of night vision devices, night reconnaissance of wire and cable routes is feasible; natural hazards and enemy ambushes can be avoided; thus decreasing wire and cable circuit construction time. Time required to repair and reestablish wire and cable circuits by troubleshooting personnel is decreased and installation time of switching and/or patching facilities and terminal equipment (telephones, teletypewriters, facsimile and data devices) is greatly reduced. The overall advantage of using night vision devices in wire installation operations is that wire communications systems can be operationally ready in a shorter period of time during night operations. In jungle operations and some stability operations environments, the capability to establish some wire communication decreases. Therefore, greater reliance is placed on radio communications.

(2) Personnel, operating unit type switchboards in a combat area where blackout facilities are not available or are nonexistent, have a definite need for night vision devices. Use of these devices to aid in operating the

switchboard eliminates the need for low level light sources or reflectors normally associated with such equipment. Utilizing night vision devices in this manner allows the operator to perform his normal duties; denies the enemy a target (low level light source); provides the operator with a means to effect minor repairs or to "tear down" and displace if required; and the capability of defending himself against the enemy if his position is infiltrated or overrun.

b. Radio Operations. Night vision devices are not required for the operation of signal equipment that is inclosed in a shelter equipped with blackout facilities. They are required during night operations for initial deployment or subsequent displacement of this equipment. Night vision devices are of great value to communications personnel in the selection of sites for radio operations and allow them to erect and sight directional antennas rapidly. In units where vehicle or pallet mounted and man-pack radio sets are used, night vision devices provide the radio operator the same advantages as those listed for telephone switchboard operators discussed in the preceding paragraph.

c. Messenger Operations. The advantages that accrue through the use of night vision devices by both motor and foot messengers are self-evident. In conventional operations where reasonably good road networks exist and where defense perimeters are fairly stable, motor messenger and foot messenger can be employed to provide a rapid, secure and reliable means of communications. Night vision devices will increase their overall efficiency.

4–7. Security of Communications Sites and Installations

a. Communications units depend upon the supported unit for security of the communications installations and sites. Although protected by the supported force, the signal facilities may be subject to sabotage and other guerrilla activities. In those situations, night vision devices and anti-intrusion devices will enhance defense measures.

b. In stability operations, communication personnel provide physical security for their communication equipment. They rely on the unit for anti-intrusion protection and assist in the defense of the unit area when required.

4–8. Night Vision Training for Communication Personnel

a. All communications personnel, regardless of the level at which they operate, should be trained in the use and care of night vision and anti-intrusion devices. They must take part in night problems, such as night command post exercises, field training exercises, and night road marches, in order to develop proficiency with the devices.

b. The same applies to the use of anti-intrusion devices and night vision devices used in conjunction with organic individual and crew served weapons with which they are armed. Most communications personnel are also drivers of the vehicles in which their respective communications equipment is installed. Training should also include driving under any and all types of conditions during the hours of darkness using night vision aids.

c. Care must be exercised during these training periods not to over emphasize the capabilities of this equipment. Over emphasis may develop over confidence in the individual, sole reliance on the equipment, and thereby instill a false security. Stress should be placed on the fact that although these devices aid in seeing at night, this does not protect an individual from being seen by the enemy first. Communicators should also be made aware that although these devices aid them in their operatons, they in no way add to communications security. Communications officers below brigade level must insure that training of communication personnel includes techniques employed in any geographical area, in conventional war or internal defense operations, either during day or night operations. This training is based on tactical communications doctrine contained in FM 24–1. Training and actual operations dealing with tactical cover and deception is based on doctrinal information covering the subject as stated in FM 31–40.

Section III. FIRE SUPPORT

4-9. General

The fundamentals of fire support are unchanged for periods of reduced visibility. However, operational techniques must be modified to consider the inherent capabilities and limitations of available fire support elements (artillery, mortars, naval gunfire, tactical air, armed helicopters), during periods of darkness. The problems associated with mobility, target acquisition, and fire support coordination are increased during these periods. Proper employment of appropriate night operational techniques, night vision aids, and target acquisition equipment will reduce losses in effectivness due to poor visibility. Available illumination, target acquisition and night vision aids are discussed in chapter 3.

4-10. Fire Support Coordination

Fire support coordination techniques as discussed in FM 6-20-2 apply equally during daylight and darkness. The visual control and navigation problems during periods of darkness increase the requirement that unit locations be continually reported, verified, and posted on battle maps and firing charts. Artillery and mortar or naval gunfire may be used as navigational aids. Available night vision, ground surveillance and illumination means may be used to mark boundaries, checkpoints, limits of advance and target locations.

4-11. Artillery (Mortar) Unit Operations

a. General. The following night operational techniques are applicable to field artillery and mortar units of all calibers. A detailed discussion of movement, reconnaissance, selection, and occupation of position is found in FM 6-140. Unit SOP must include details for all phases of night operations.

b. Displacement. Fire support units are prepared to displace under all visibility conditions to support the ground tactical plan. Unit SOP includes the use of blackout driving techniques and available night vision equipment, such as, electronic binoculars and metascopes. Airmobile units prepare SOP for heliborne operations during periods of reduced visibility (paragraphs 4-28 through 4-38). These SOP are detailed in nature, yet simple in execution.

c. Night Occupation and Organization of Position.

(1) Practice in night occupation of a position is necessary to insure smooth operations. When time and situation permit, a daylight reconnaissance is made. This reconnaissance includes the position area, alternate positions, and routes into and out of the area. The number and location of route markers required is determined and the plans for security on the march and in the position are established. Night occupation of the position is facilitated when adequate guides are made available. Guides should know the location of each installation in the area. At the conclusion of the reconnaissance, all key personnel, including drivers, are briefed. In making a reconnaissance prior to a night occupation, section marking stakes are used to designate the planned position of each weapon, each instrument used to lay for direction, and each aiming post. A marker is also emplaced for orienting the instrument that establishes direction. An identifying tag, with lettering large enough to be read under blackout conditions is attached to each marking stake. Night occupations are also facilitated by accomplishing certain other tasks during daylight. Some of these tasks are—

(*a*) Emplacing auxilliary aiming posts.

(*b*) Laying wire.

(*c*) Digging parapets, ammunition pits, trail pits, and foxholes.

(*d*) Preparing the CP and FDC.

(*e*) Installing field expedient night lightning devices on auxiliary aiming posts.

(2) When fire control instruments are used at night, it is often difficult to determine the correct light on which to sight. Identification is made by blinking the light in accordance with prearranged signals or by using colored lights. Only necessary night lights are used. One weapon should be layed at a time. The use of collimeters rather than aiming stakes reduces the chance of error.

(3) A marker for the end of the orienting line is emplaced and illuminated. This marker is from 50 to 300 meters from the instrument.

(4) A night occupation requires more time

than a daylight occupation and there is a greater need for order and efficiency. Particular care is necessary in guiding vehicles during blackout. Immediate corrective action must be taken to overcome violations of light and noise discipline.

(5) Rapid displacements and night movements make it imperative that each unit prepare a loading plan for a uniform system of loading and unloading equipment. The weapon position should be so organized that each man knows where each item of equipment is located at all times.

(6) Current night lighting devices on aiming circles and weapons sights provide adequate light for night operations.

(7) Flashlights or expedients should be filtered to prevent a breach of light discipline. Current active and passive night vision devices as discussed in chapter 3, should be used whenever possible. These aids facilitate the handling of ammunition, servicing of weapons, maintenance of vehicles and equipment, installation and weapons, maintenance of communications, and the conduct of survey. Should daylight reconnaissance be impossible, maximum use of night vision devices is essential. Techniques discussed throughout this manual will assist in the defense of the position area at night.

4–12. Adjustment of Fire

a. Detailed fire planning and adjustment during daylight reduces the need for adjustment of artillery, mortars, or naval gunfire at night. Adjustment techniques used in dense jungle and rugged terrain are applicable at night. All observers must become proficient in techniques which aid the observer during periods of reduced visibility. These techniques are adjustment by sound, adjustment under illumination, locating targets by shifts from known points and utilizing WP shells as marking rounds. Available active infrared devices may be used to signal other friendly elements or aerial observers. Each type of night vision aid may be employed to assist in surveillance, navigation, and target acquisition.

b. The aerial observer has the same basic problems at night as those of the ground observer. Through the use of available searchlights, and artillery or aerial illumination, the aerial observer can more easily detect enemy activities. Using the starlight scope or crew served weapon sight, he can often increase his observation capabilities. Although reflection from aircraft windows and vibrations creates difficulties with this equipment, it will be useful. Additionally, the aerial observer at night is often invaluable as a radio relay.

c. The ground and aerial observer using a common radio net should work as a team to overcome their respective limitations. After locating friendly elements on the ground, the aerial observer may "creep fire in" until the ground observer is able to spot the rounds and control the adjustment visually or by sound.

4–13. Fire Planning

a. Survey and registration should be completed during daylight hours. If a flash base can be established, a high burst or center of impact registration may be conducted after dark. All plans must be simple and well coordinated. The possibility of sacrificing surprise should be considered when planning any fires in support of a night operation.

b. Detailed fire planning is required for well executed night operations. Harassing and interdictory fires upset enemy operations and reduce his mobility. Defensive targets should be adjusted prior to darkness on avenues of approach and gaps in fields of fire and observation.

c. Fires may be scheduled or placed on call during night operations to—

(1) Isolate the zone of attack and the objective.

(2) Interdict likely ambush sites.

(3) Discourage the enemy's use of snipers and command detonated mines.

(4) Detonate mines and boobytraps.

(5) Protect the rear of a column from followers.

(6) Protect vulnerable flanks.

(7) Assist in navigation.

(8) Harass and interdict (H&I)

d. Preparations are often not used at night, particularly when the attacking force is moving by stealth. However, preparatory and blocking fires should be planned and available

on call. Often, preplanned fires may be used on alternate objectives as a ruse or to add to the enemy's confusion. When exact enemy locations are unknown, large areas may be reconnoitered by fire, using artillery or mortar zone and sweeping techniques.

4–14. Countermortar/Counterbattery Fire

a. A common enemy tactic is to launch a night mortar attack with large quantities of accurate and timely fire being delivered in a short period of time. A thorough, rapidly reacting countermortar plan is essential to defeat this threat.

b. A countermortar plan should be prepared, using all available fire support means. Targets are plotted on possible mortar locations and avenues of approach. Sectors of the areas are assigned to the available fire support units commensurate with their respective azimuths of lay and range capabilities. Should a mortar attack occur, all or portions of the countermortar plan may be fired by target or assigned sector. If the actual or suspected locations of enemy mortars are established, they are immediately engaged. As a minimum, the direction from which the mortars are firing would indicate which portions of the countermortar program are to be fired.

c. In order to detect enemy mortar locations, available radars, observations posts, and listening posts are coordinated to report incoming rounds, flashes, or sounds of firing. Personnel receive instructions on rendering shell reports. Appropriate communications are established to reduce delays. Often, outgoing artillery and mortar fire create clutter for radars and confuse observers. A technique for rapidly check firing should be established. An aircraft should be kept on alert, so that it may be airborne in time to detect enemy mortar muzzle flashes. It is essential that all countermortar plans be coordinated and tested to provide for minimum reaction time.

4–15. Aerial Fire Support

The employment of tactical air, armed helicopters, and aerial rocket artillery, in support of night operations, requires detailed planning and coordination because of the difficulties in target identification, location of enemy troops, and control. Generally speaking, cannon artillery and mortars are preferable for close support during periods of reduced visibility. FM 1–110 provides a detailed discussion of the employment of armed helicopters. Paragraphs 4–28 through 4–38 dicuss techniques of helicopter operations at night.

a. All available illumination or night vision devices should be considered for assistance in determining the location of friendly troops and identifying targets. Once the pilot or forward air controller identifies the friendly locations, the target may be designated by an azimuth and distance (polar plot) from an easily identified point. Care should be taken not to disclose friendly positions. Searchlights, illumination rounds, and airdropped flares aid in troop and target identification and control. Detailed planning and coordination is essential to preclude blinding pilots or unnecessarily sacrificing security.

b. The starlight scope, mounted on a rifle or machinegun, may be used by helicopter door gunners or observers to acquire and engage targets. The target is marked by tracer rounds for further engagement by other armed aircraft.

c. Searchlights and floodlights may be attached to helicopters to facilitate the employment of armed helicopters at night.

4–16. Nuclear Fires

The employment of nuclear fires in support of night operations is basically the same as for daylight operations. The loss of surprise and the adverse effects of nuclear weapons should be considered in greater detail at night. Problems peculiar to night operations in a nuclear environment are obstacles, dazzle, loss of night vision and adverse effects on night vision, and target acquisition equipment. A detailed discussion of the employment of nuclear weapons is found in FM 101–31–1 and FM 101–31–2.

Section IV. ENGINEER SUPPORT

4–17. General

a. Elements of the divisional engineer battalions are placed in direct support or attached to a brigade of the division. The engineer elements are responsible for combat engineer support such as—

(1) Bridging of rivers, waterways, and short gaps.

(2) Rafting of personnel and equipment on rivers and waterways.

(3) Assistance in laying, clearing, and breaching minefields.

(4) Demolitions of obstacles and fortified positions.

(5) Construction of necessary combat roads, trails, helipads, and landing strips for light aircraft.

(6) Assistance in erection of obstacles required by the maneuver battalion.

(7) Operation of water purification equipment.

(8) Installation of atomic demolition munitions (ADM).

(9) Conducting engineer reconnaissance and producing engineer intelligence.

b. The engineer element uses night vision aids and modified daylight techniques at night. The separate functions of the engineer element are discussed briefly in the following paragraphs.

4–18. Bridging

a. Erection of the Class 60 or M4T6 Bridge or Raft. Erection of the Class 60 or the M4T6 bridge is accomplished using the same techniques used during daylight hours. When combat conditions are favorable, the bridge site may be lighted with visible light. Luminescent lane and bridge limit markers are used to a maximum to guide vehicle operators making the crossing. When combat conditions dictate that the bridge be erected under cover of darkness, the engineer unit will use night vision aids including searchlights in the infrared mode. The bridge site is lighted with searchlights using the infrared mode. The searchlights, mounted on the combat engineer vehicle (CEV) or on available ¼-ton trucks, provide a high intensity light source for the erection crew. The infrared light source from a metascope or other handheld infrared light device is used for close or exacting work in areas where the beam of the searchlight is obscured. Overall control and direction is exercised by the engineer officer in charge on the near bank, who uses the tripod-mounted night observation device for infrared viewing. Heavy equipment, such as dozers, cranes, graders, and bridge erection boats, are equipped with infrared filters on the headlights and the operators use driving binoculars.

b. Erection of the Mobile Assault Bridging (MAB), Bridges or Rafts. Erection of mobile assault bridging (MAB), bridges or rafts, is accomplished using the same techniques used during daylight hours. Each of the MAB vehicles is equipped with infrared filters on the headlights. The driver and vehicle commander are equipped with electronic binoculars for infrared viewing. During a night river-crossing operation, dozers and operators equipped with night vision devices precede MAB vehicles to the river, clear any obstructions, and prepare required river entrances. The MAB vehicles, upon becoming waterborne, assemble as a raft or bridge. A metascope or other handheld infrared light source is used to aid in the detatiled assembly of the MAB units. When used for rafting operations, available ¼-ton vehicles with infrared searchlights floodlight the loading area to facilitate loading on rafts. The first vehicle to cross is a dozer or CEV which is landed on the far shore for contruction of exits from the river. An infrared equipped ¼-ton truck may also be used on the far shore to provide a high intensity light source for loading and unloading the MAB rafts.

c. Armor Vehicle Launched Bridge (AVLB). The AVLB is used to span short gaps of 60 feet or less. Designed to be carried on a modified M60 tank chassis, this bridge is launched at night, when required, by flooding the bridge site with the light (visible or infrared) from the searchlights carried on accompanying tanks or the CEV. When infrared light is used, the AVLB driver, equipped with electronic binoculars, is thus able to see the gap he is spanning and launch the bridge.

d. Aluminum Assault Footbridge. Using night vision devices, this footbridge can also be erected at night for crossing by dismounted troops.

4-19. Laying, Clearing, and Breaching of Minefields

Engineer elements provide assistance and technical advice in laying, clearing, and breaching minefields. During night operations, minefields or proposed minefields are flooded with high intensity infrared light from the searchlights of accompanying tanks, CEV's or ¼-ton searchlight equipped vehicles. Using this infrared light source, engineer personnel equipped with electronic binoculars lay, clear, or breach minefields in accordance with established minefield doctrine. Where a high intensity light source is not available, or where stealth is required, engineer or other personnel equipped with the electronic binoculars and working in pairs, use the metascope or other handheld infrared light device as an infrared light source.

4-20. Demolitions

a. During night operations, engineer demolition crews, equipped with night vision devices prepare and set necessary demolitions to breach obstacles and reduce fortified positions. The CEV, which has both an infrared and demolition capability, is sometimes employed in conjunction with these demolition crews.

b. Atomic demolition munitions specialists prepare ADM sites when required, using night vision aids.

4-21. Combat Construction

a. Horizontal Construction. During night operations, engineer construction vehicles, such as cranes, shovels, dozers, graders, and dump trucks equipped with infrared headlights and with operators equipped with electronic binoculars, perform construction tasks essential to an operation. Tasks, such as road and airfield construction and other horizontal construction, are accomplished at night by engineer crews and equipment using night vision devices.

b. Vertical Construction. Vertical construction tasks, such as the construction of observation towers, standing obstacles, barriers, and fortifications are also accomplished at night either with visible light or using night vision devices.

4-22. Water Purification

Water purification teams are equipped with night vision devices to permit water purification operations to proceed on a 24-hour basis. During sustained operations, water points are flooded with infrared light to permit tank truck operators, equipped with electronic binoculars, to load their vehicles.

4-23. Night Vision Equipment for Engineer Vehicles

a. Combat Engineer Vehicle (CEV).

(1) The CEV is a full-tracked vehicle which consists of an M60 Tank Hull, with a front-mounted, hydraulically-operated bulldozer; surmounted by a turret bearing a 165-mm demolition projector; a retractable boom of welded tubular construction; and a winch. The CEV provides engineer units in the forward combat areas a versatile, armor-protected means of performing combat engineer tasks under hostile fire. Representative of these tasks are—

(*a*) Destruction or removal of roadblocks, obstacles, and barriers, by the use of the demolition charge projector, the dozer blade, winch, or boom.

(*b*) Construction of roadblocks or obstacles by the use of the dozer blade, winch, or boom.

(*c*) Passage of short dry gaps, ditches, and craters by earthfilling using the dozer blade.

(*d*) Transportation to site and placement of fixed span assault bridging or fascines for short gap passage.

(*e*) Construction of near short approaches for bridges, rafts, and amphibious vehicles such as the armored personnel carrier. Construction of the far shore approaches when transported to the far shore by raft.

(*f*) Destruction of key features such as bridges, railroad facilities, and installations by use of the demolition charge projector during denial operations.

(*g*) Construction of combat roads,

trails, and avenues of approach in support of offensive operations.

(*h*) Construction of hasty tank and gun emplacements, and expedient entrenchments and protective shelters in offensive, defensive, and retrograde operations.

(*i*) Assistance in the assault breaching of minefields by the launching of explosive mine clearing devices (such as the "snake").

(2) For night operations, the CEV is equipped with an infrared/visual gunners, operators, and commanders periscope—the M18 infrared binocular for the commander; and the electronic binocular for the operator when used in open hatch viewing. Other night vision equipment organic to the CEV is the crew-served weapons sight (image intensifying) for use with the machinegun.

b. Armored Vehicle Launched Bridge (AVLB). The AVLB, discussed in paragraph 4–18*c*, is equipped with the following night vision devices.

(1) Infrared filters for headlights.

(2) Electronic binoculars.

(3) Infrared periscopes (2 each).

c. Class 30 Assault Trackway. The class 30 Assault Trackway is a metallic track carried on a 5-ton bridge truck. The track is used to improve the bearing capacity of short stretches of roads. If used at night, it should be equipped with infrared filters for headlights and the driver with electronic binoculars.

4–24. Control of Night Vision Equipment

Night vision equipment is not available for all personnel and equipment in engineer units. Presently authorized night vision equipment, therefore, should be strictly controlled at engineer company or battalion level and allocated on a daily (nightly) basis to those engineer elements having a mission essential task during the hours of darkness. When required for mission essential tasks, night vision equipment not authorized to engineer units is obtained from the division support or other logistical command.

Section V. INTELLIGENCE SUPPORT

4–25. General

The success of any operation may well depend on the intelligence available to the commander. Accurate and timely intelligence is mandatory for the success of the operation. Intelligence requirements do not change with the coming of darkness. The commander's three major intelligence needs still exist, those being—knowledge of the weather; the terrain; and the enemy's capabilities. All three must be considered to properly employ night vision devices and artificial illumination means. Of these, weather has a significant effect on the employment of night vision devices and artificial illumination. Terrain observation with night vision devices, both ground and aerial, is limited in varying degree by vegetation, shadows, and topographic irregularities; however, these same restrictions apply to visual observation in daylight. See also FM 30–20, FM 30–31, and FM 30–31A.

4–26. Effect of Weather on Night Vision Planning

a. Generally the effect of weather on night vision, target acquisition, and surveillance devices varies according to the specific environmental phenomenon and the type of devices used. Within the area of operation, the weather between daylight and darkness can change completely.

b. Fog, dust, smoke, or rain will diffuse or scatter infrared radiation and reduce its range. Heavy clouds can adversely affect infrared sensor imagery. Heavy rain, especially during the monsoon season, and heavy clouds can reduce the radar range. Strong winds cause acoustic equipment to be totally ineffective. Heavy rains will also restrict the use of acoustic equipment. Heavy overcast will degrade the effectiveness of image intensification and illumination devices. Moonlight and starlight, or their absence, directly effect image intensification devices. Adverse temperature changes will affect the batteries of night vision devices in much the same way temperature affects radio batteries. Adverse weather conditions can affect aircraft flying performance as well as the device itself.

4-27. Counterintelligence and Security

a. A basic counterintelligence function of the battalion S2 consists of implementing and supervising counterintelligence measures directed by higher headquarters. These measures are directed and controlled by battalion or higher headquarters through the use of standing operating procedures (SOP), standing signal instructions (SSI), signal operating instruction (SOI), administrative orders (ADMINO), and operation orders (OPORD).

b. Although the fundamentals of security are the same at night as in daylight, the provisions of timely and accurate warning is paramount. Night vision devices, such as the electronic binoculars, starlight scopes, and others, have greatly improved the battalion's capability in avoiding a surprise attack or guerrilla operations at night.

c. Night operations require special attention to communication security (COMSEC) and electronic counter-countermeasures (ECCM). Night operations may benefit appreciably by exploitation of supporting signal intelligence (SIGINT) and passive electronic countermeasures (PECM) resources. See paragraphs 3-23 through 3-28 and paragraph 4-5*c*.

Section VI. AVIATION SUPPORT

4-28. General

Night airmobile operations are feasible and are considered a normal part of night operations. They are conducted to support the ground tactical plan. Procedures for planning, preparation, and conduct of daylight airmobile operations are discussed in FM 57-35. Procedures for conduct of night airmobile operations parallel those prescribed for daylight; however, more detailed planning and increased emphasis on certain of the planning procedures is required. This section outlines the key considerations associated with night airmobile operations and identifies those procedures and techniques.

4-29. Advantages

Advantages of conducting night airmobile operations include the following:

a. Darkness reduces enemy visual observation.

b. Greater freedom of action is possible during the hours when enemy air defense measures are least effective.

c. Night airmobile operations deny the enemy the freedom of action he otherwise would have under cover of darkness.

d. Maximum surprise can be achieved.

4-30. Disadvantages

Disadvantages of conducting night airmobile operations include the following:

a. Difficulty of target acquisition and fire control during the aerial fire support operations.

b. In the absence of electronic aids, difficulty of navigation.

c. Requirement for pickup (PZ) and landing zone (LZ) lighting.

d. Obstacles cannot be readily seen, and objects or obstructions on the ground create hazards to landing aircraft.

e. Landing zones must be larger for aircraft landing during periods of reduced visibility.

f. Lack of visibility dictates wider formations, thereby increasing the time necessary to conduct airmobile operations.

4-31. General Considerations

Inherent problems in night operations are overcome largely by—detailed planning; well trained and disciplined troops; ingenuity of ground and aviation unit commanders; development and practice of night operational SOP to the point of routine; and by the use of existing techniques and equipment. Despite the handicaps associated with night aircraft operations, there are certain factors which favor these operations. Night airmobile operations provide friendly forces the capability of disrupting, disorganizing, and demoralizing the enemy's night effort. It is more difficult for the enemy to react effectively at night. Therefore, the factors that impede friendly night operations can be made to work to advantage by handicapping the enemy in his attempt to resist or mount a night attack.

4–32. Coordination

The coordination required for night operations include those items necessary for a daylight operation as discussed in FM 57–35 plus the consideration to minimize the deterrent effects of the reduced visibility in which night operations are conducted. The aviation unit establishes liaison with the supported unit at the earliest possible time after the decision has been made to plan a night operation. This is accomplished to gain knowledge of the operation being planned and to provide advice to the supported commander on aviation matters affecting the operation. Coordination is affected with the pathfinders, artillery units, and fire support elements.

4–33. Reconnaissance

Day and night reconnaissance for airmobile operations is always desirable. Day reconniassance is necessary to provide the airmobile force and mission commanders and their staffs with knowledge of the terrain with which concerned. Night reconniassance, preferably under light conditions similar to those anticipated for the actual operation, is essential to determine if the control points selected during daylight are visible from the planned formation altitude at night. Time, distance, and headings between control points are checked. Night appearance of the landing zone (LZ) is observed, and its characteristics noted. A suitable orbit area for flare aircraft, easily identifiable during darkness, is selected. This area should be in close proximity to and up wind from the LZ. Prominent terrain features or navigational aids are used to identify orbit areas. Whenever possible, the airmobile force commander and the aviation mission commander jointly reconnoiter the area in the same aircraft. By so doing, the airmobile force commander insures that all parties are looking at the same terrain and understand exactly what is being planned. A combined reconnaissance also reduces operational area traffic, which might attract enemy attention and in crease the possibility of compromising the operation. The use of image intensification night vision devices (such as the individual night weapons sight or the crew served weapons sight) by the aerial reconnaissance party enhances the ability to observe the LZ and objective area from greater distances, minimizing the possible disclosure of the intended area of operations. Patrols or pathfinder units may infiltrate by air or on foot to the proposed LZ prior to the operation to determine presence of enemy and the conditions of the LZ.

4–34. Planning Considerations

Night operations require greater emphasis and different techniques than daylight operations in the areas indicated in *a* through *q* below.

a. A high level of individual and unit training, and operational proficiency is required.

b. Since planning in greater detail is required for night operations, everything possible should be reduced to SOP, or more time is required to complete planning and coordination details.

c. Weather conditions are required that will permit flying at altitudes that provide positive terrain clearance.

d. Aircraft, flying in formation at night, are more widely separated.

e. Orders and schemes of maneuver should be as simple as possible.

f. More time is required for logistical support functions. It may be necessary to establish PZ and aircraft refueling/rearming areas farther to the rear than during daylight operations.

g. Detailed planning for consolidation or for continuing the attack must be accomplished.

h. Enemy fire is not as effective at night, but the psychological effects of tracer fire should be considered in troop training for night airmobile operations.

i. PZ and LZ should be larger than in daylight to facilitate night operations and are selected with greater emphasis on their acceptability from an aviation standpoint. The selection criteria applicable to the selection of day PZ and LZ are equally applicable for night operations; however, increased emphasis is placed on the following:

(1) Approach and departure paths, free of obstacles.

(2) Obstacles that cannot be easily seen should be clearly marked.

(3) LZ must be easily identifiable.

(4) Areas, heavy with dust or recently burned over, should be avoided when possible.

(5) Primary and alternate PZ/LZ are selected using the same criteria. Alternate LZ should be at least 1,000 meters from the primary LZ so that they cannot be defended by the same enemy unit encountered on the primary LZ.

j. Deception measures should be planned. These may include feints, the use of decoys and simulation devices, illumination demonstrations, or artillery fires to cover the noise of aircraft.

k. Selection of night flight routes require greater emphasis, specifically on—

(1) Weather.

(2) Terrain avoidance.

(3) Prominent terrain features easily recognizable at night for navigation purposes.

(4) Location and coordination with friendly fire support units.

(5) Location of planned artillery fires and airstrikes.

(6) Distance to the objective area.

l. Navigation is more difficult at night. To minimize the problem of en route navigation, air control points (ACP), communication checkpoints (CCP), and release points (RP), should be identifiable from the air. Methods commonly used in Southeast Asia to assist en route navigation are—

(1) An aircraft located at a higher altitude to vector the airmobile force to the landing zone.

(2) Fused flares placed at selected points along the flight route.

(3) Nondirectional homing beacons placed at selected intervals.

(4) Flares or searchlights to illuminate the control points.

(5) Coordination effected with friendly units along the flight route to assist in guiding the aircraft.

(6) On board navigation aids such as the DECCA Navigation System.

m. Artificial illumination should be planned and immediately responsive. U.S. Air Force and Army flare aircraft should be on station for immediate employment. An additional method of illumination is helicopter mounted searchlights utilized for, but not limited to, the following missions: illuminated aerial reconnaissance, enemy targets, LZ, and demonstrations. Surprise in the LZ may be obtained by withholding illumination until the landing phase. Properly timed, direct illumination may serve to blind the enemy. Flares dropped three kilometers from the LZ on the upwind side away from the direction of turn provide the most favorable light without blinding the pilots. This light also outlines obstacles on the approach and takeoff path. Illumination should be started 2 minutes prior to landing to allow the pilot's eyes to adjust to the light. Once illumination has started it must continue during the landing and departure phase due to partial loss of night vision of the pilots. Extensive aviation unit training is required in procedures to counteract the possibility of partial or total loss of night vision by air crewmembers.

n. Greater control over aircraft formations at night is essential. Radio communications are required to control aircraft. Flight leaders should establish communications with the control center at the designated communication checkpoints or at a designated time (fig. 4–1).

o. Pathfinders provide ground-to-air communication and navigational assistance at the aviation base, PZ, en route, and LZ (fig. 4–2), utilizing the following devices:

(1) Radio voice control.

(2) Obstruction lights.

(3) Glide Angle Indicator Lights (app L).

(4) Nondirectional homing beacons.

(5) Lanterns.

(6) Baton flashlights.

(7) Light guns.

(8) Beacon Lights (app M).

p. During nonilluminated helicopter operations, pathfinders are delivered ahead of the main body. The length of time pathfinders precede the initial echelon is dictated by the requirement to sacrifice the element of surprise; by the type and extent of prestrikes; the size of the operation; navigational difficulties anticipated; and the condition of the landing site. The method of delivering pathfinders is determined by security and operational require-

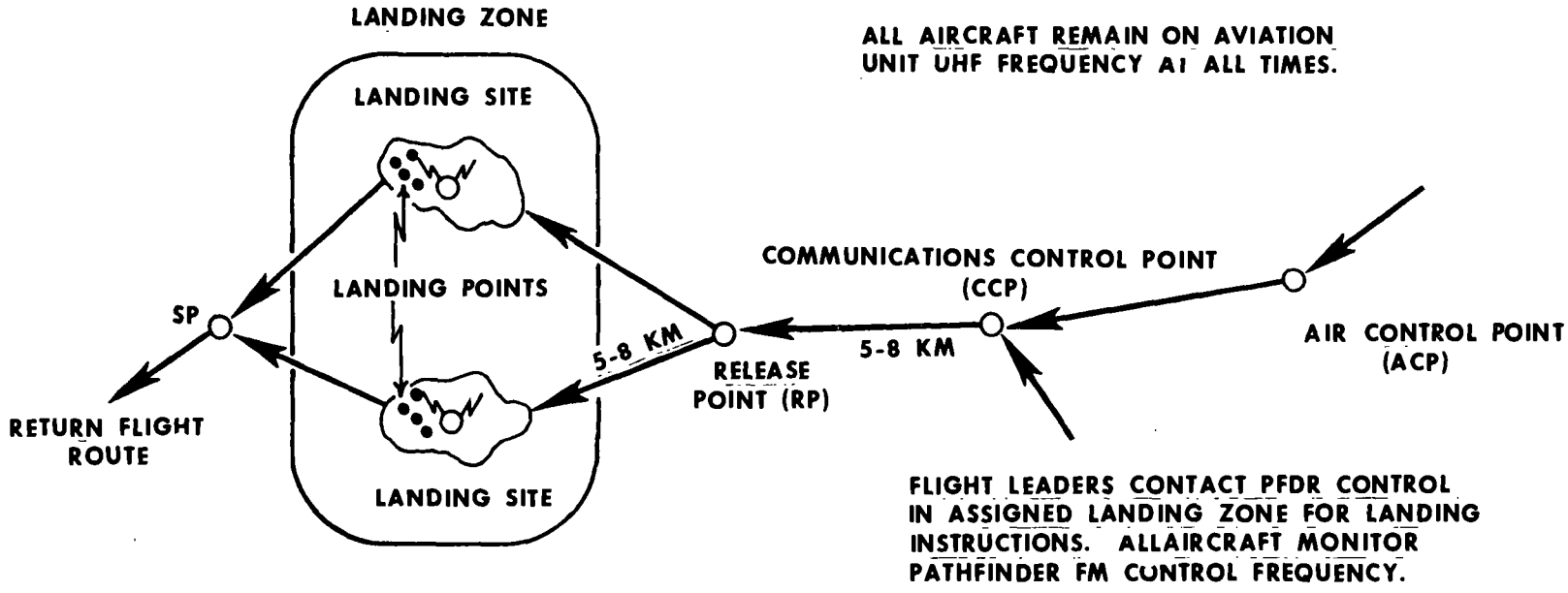


Figure 4–1. En route communications procedures with pathfinders in the landing zone.

ments. They are either parachuted on or near the landing zone, airlanded in total blackout, or airlanded with minimum illumination. The last method is the most accurate and desirable, permitting a hasty visual reconnaissance of the landing site, thereby reducing the time pathfinders must precede the main body.

q. When an airmobile operation is conducted under total illumination, the tactical plan will dictate whether pathfinders accompany the initial echelon as in day operations or precede the main body by a minimum amount of time. In either case, it is desirable that pathfinders provide lighting to identify touchdown points for the lead aircraft of the formation.

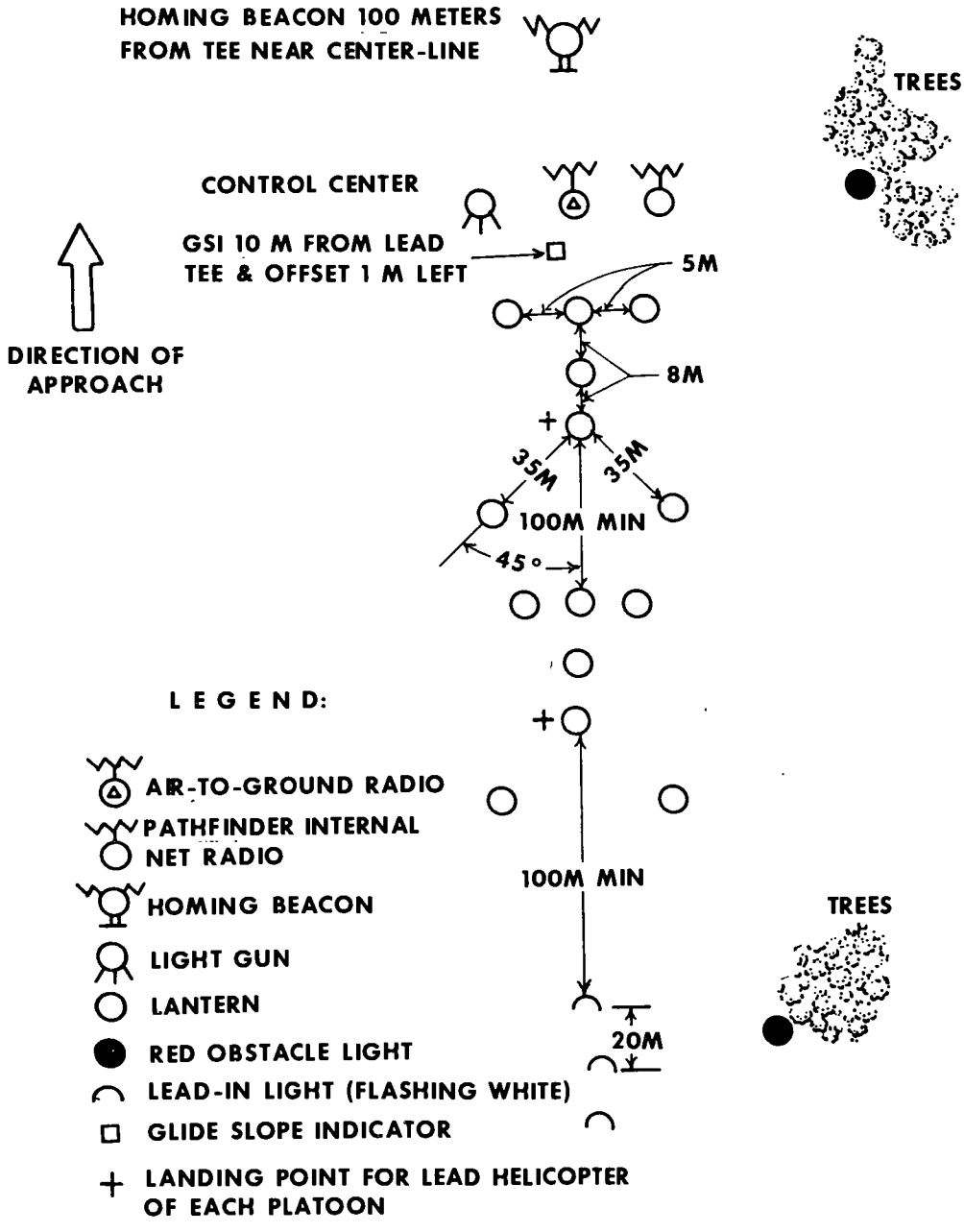


Figure 4–2. Night landing site for one platoon (6 aircraft) of helicopters; sections in column, vee formation.

4-35. Night Fire Support

a. It is often necessary to use artillery fire more extensively at night to compensate for the reduced effectiveness of other fire support means. On the other hand, when operations are conducted beyond the range of conventional artillery, and/or advance fire support bases cannot be established, increased aerial fire support must be planned and coordinated. Plans should provide for fire support from organic sources. Image intensification devices provide an advantage to airborne observers in locating targets for fire support elements.

b. Accurate air to ground fire without illumination is difficult. Illumination can be provided by methods as discussed in the preceding paragraphs. Fire support elements must rely on prearranged communications and visual signals to identify friendly troop locations. Methods commonly used to light a perimeter at night for aerial fire support in Southeast Asia are—

(1) Tracer/ammunition.
(2) Flares.
(3) Electroluminescent panels.
(4) Chemiluminescent panels.
(5) Fire arrows.
(6) Cans filled with dirt and fuel.

c. The fundamentals involved in night fire support operations involving armed helicopters and aerial rocket artillery are the same as those in daylight operations except that more control measures are necessary at night. The following control measures are used:

(1) *Release point (RP).* Armed helicopters are released from formation control at the RP and proceed to the target area.

(2) *Orbit point.* This point should be easily identified to facilitate a quick assembly of aircraft at anytime while far enough away from the target or landing zone to prevent a loss of surprise.

(3) *Attack heading.* A control aircraft located overhead can provide headings for the firing runs to reduce confusion in the target area.

(4) *Attack patterns.* Patterns should be simple and parallel to the line of contact when making a firing pass.

(5) *Altitude.* Termination of firing runs should be completed at a higher altitude.

(6) *Troop safety buffer zone.* A larger safety buffer zone should be established to preclude firing into friendly positions.

(7) *Illumination.* When illumination from flares is employed, the enemy is generally unable to determine helicopter attack patterns if the helicopter does not penetrate below the altitude of the flares or within the perimeter of the illuminated area. Searchlights also provide effective illumination of the target area; however, helicopter searchlights should be used intermittently to preclude continuous tracking of the helicopter.

4-36. Operating Considerations and Techniques

a. Aviation and ground unit training will overcome most difficulties encountered during night operations.

b. Pilot vertigo problems encountered during low visibility and night operations are reduced by having an instrument rated aviator in each aircraft.

c. Night formation training is essential to successful night airmobile operations.

d. Fueling, arming, preflight, and similar aircraft operations should be completed during daylight, if possible.

e. If ground lineup of the aircraft is necessary, it should be completed during daylight to save time and simplify control procedures in the PZ.

f. The bottom half of aircraft navigation lights should be masked to prevent easy detection and location from the ground.

g. Rotating beacons on the aircraft should be turned off when necessary, to prevent observation by the enemy.

h. Adverse weather should be avoided during night operations; however, aviators must be trained to maintain their flight formation or to employ established unit procedures for breaking formation if it is encountered.

4-37. Night Training

Requirements will continue to increase for night aviation support for ground units. On the job training while performing normal night missions in most instances is not sufficient to keep all aviators proficient in night operations. Continuous night unit training must be accomplished in order to safely con-

duct company and battalion size night airmobile operations.

4–38. Downed Aircraft Procedures

Procedures used in the event an aircraft goes down at night must be well planned and coordinated among all elements participating in the operation. Difficulties imposed by reduced visibility and possible compromise of the downed aircraft position by the use of artificial illumination make recovery operations at night especially hazardous. Detailed plans must be developed to include emergency communication nets, frequencies, and call signs. Recovery elements, including security forces, should be designated. The airmobile force commander must carefully weigh the advantages and disadvantages of attempting recovery operations at night. The primary consideration is the safety and evacuation of personnel, particularly injured personnel. Depending upon the tactical situation, it may be necessary to destroy the aircraft to prevent its capture by the enemy. Conversely, there may be situations where it is more practicable to delay recovery operations until daylight hours. When circumstances warrant, however, recovery operations may be conducted at night. To reduce the possibility of compromise of the downed aircraft position, lighting must be held to the minimum required to accomplish the mission. If rescue or recovery aircraft are unable to locate the downed aircraft by other means, the aircraft beacon or navigational lights may be turned on intermittently. Armed helicopters should be employed to conduct reconnaissance of the area and to provide suppressive fires for recovery of the aircraft or personnel. Effective use of night vision devices and artificial lighting such as flares, illuminating rounds, or searchlights enhances the chance for success. The use of indirect lighting by searchlights reduces the possibility of compromising the position area and provides adequate lighting for accomplishing major recovery tasks. Helicopters equipped with searchlights may be employed to provide direct lighting for recovery crews to accomplish the more detailed tasks involved in evacuating the aircraft.

CHAPTER 5
COMBAT SERVICE SUPPORT

Section I. GENERAL

5–1. Purpose
This chapter contains procedures for combat service support of night operations. Supply, maintenance, transportation, and military police support are emphasized. The broad aspects of combat service support are contained in FM 54–2 and FM 100–10.

5–2. Basic Considerations
a. Combat service support planning for night operations is generally the same as for daylight operations. Emphasis is placed on insuring continued combat service support.

b. Planners should anticipate and plan to counter the effects of losses of supplies, equipment, and key personnel; and enemy interference with both surface and air movements in rear areas. Combat service support of night operations is critically affected by—

(1) The potential loss of effectiveness in performing technical functions due to reduced visibility.

(2) The curtailment of manpower because of increased security requirements.

(3) The requirement for rigid enforcement of camouflage and light discipline accentuated by the increased nighttime activities of logistic facilities.

5–3. Organization and Functions
Combat service support units are organized and function essentially the same for night operations as for day operations. The degree of variation between day and night in the functions performed is directly related to the mission of each unit.

a. Personnel and administrative functions can be performed without night operating aids because their normal method of operation is in rear areas within lightproof shelters.

b. Supporting medical service operations are generally not critically affected by night operations except for the increased workload that may result from sustained operations. However, medical service support within maneuver elements in contact with enemy forces must be varied as described in paragraphs 5–16 and 5–17.

5–4. Employment
Combat service support units perform essentially the same functions in night operations as in day operations.

a. General Operating Procedures. Support units in the support area make maximum use of light-subduing shelters. SOP are established that prescribe the type of work that can best be performed at night and the type that should be performed in daylight. Resupply, emergency maintenance, movement, and traffic control must be continuous in order to provide adequate support. Therefore, elements providing this support in forward areas require the use of night-vision aids. Operations conducted in the open in rear areas can be performed, using low-light-level devices, but adequate plans must be made during the day for such operations.

b. Location and Displacement. Location and displacement doctrine remain the same with increased emphasis placed on selecting sites that provide protection from observation. Unit locations should be selected so as to preclude frequent displacements.

c. Security. Local security is provided by individual units. Coordination of local security is accomplished by the appropriate rear area commander. Security forces are equipped with night vision and anti-intrusion devices to prevent penetration by enemy elements (ch 14).

Section II. SUPPLY SUPPORT

5-5. General

The principles governing supply support of night operations are the same as those pertaining to day operations. However, some techniques of implementing these procedures must be changed to accommodate the changed demands of operations under conditions of decreased visibility. These are discussed below. The requirements for some types of supplies, such as ammunition and repair parts, can be expected to be in proportion to combat operations. Night operations will cause some increase in daily requirements for such supplies. For other types, such as personal items and construction materials, some increase may be expected but not in proportion to the increase in hours of combat per 24-hour day. Provisions must be made to facilitate quick location and identification of material that is usually stored in the open (subsistence, petroleum, and ammunition). This planning includes provision for lighting, or night vision devices, based on the degree of secrecy required and the enemy's capability for detection. Careful preparation must be made for the security of supply facilities with attention to conservation of manpower, since personnel becomes less effective after sustained operations over a long period.

5-6. Supply Planning

Planning for supply support of night operations includes all considerations necessary for support of day operations and such special considerations as—

a. The location of supply points in relation to the light line and the kind of illumination that can be employed to support sustained night operations.

b. The special requirements of combat elements (i.e., classes I, V, VII).

c. Which supplies must be provided at night and which can be delayed until daylight.

d. The additional security to be provided to protect forward supply points.

5-7. Subsistence

a. As the capability of combat units to conduct night operations increases, the resulting sustained operations increase the requirements to provide night meals for forces involved in the night operation. The method of establishing requirements dots not change, but kitchens may be open late or round-the-clock. Subsistence provided is based on strength. Requests for specail rations are forwarded to the appropriate stock control center.

b. No special requirements for illumination exist for supply of subsistence. Rear area supply points normally rely on subdued visible light devices and forward area facilities use night vision binoculars or goggles or infrared metascopes, where permitted. Identification of packages, containers, and pallets at night is improved by application of fluorescent tape or paint to designate contents and destination.

c. Subsistence may be distributed with ammunition. When this is done the need for planning is increased due to reduced visibility.

5-8. Supply of End Items

a. Night operations introduce factors that affect requirements for replacement end items. It can be expected that the loss ratio and accidental damage rates will increase under conditions of reduced visibility. Decreased visibility also tends to reduce damage from enemy action. The potential effect of low visibility is estimated for each planned night operation.

b. For night operations the need for special equipment not used in day operations, such as night vision devices, increases the total requirements for end items. Such items are provided through normal supply channels.

5-9. Supply of Construction Materials

Night operations may increase the requirement for barrier and fortification material. The requirement increases the difficulties in recovering such material during darkness and/or the destruction of such material, as called for by tactical plans. Increased security requirements for support elements may also result in an increase in the use of barrier and fortification material. Such supplies are bulky and heavy and require the use of lifting equipment. Increased night operations require that equipment with infrared light sources, and personnel with night vision aids be provided.

5-10. Petroleum, Oils, and Lubricants (POL)

a. Consumption of POL is increased during sustained night operations.

(1) Generators operate continuously and more are required to provide power.

(2) Spillage is greater because of reduced visibility.

(3) Ground vehicles operate in lower gears and thus use more fuel.

b. Distribution of bulk fuel involves the operation of dispensing equipment, therefore, POL supply points require illumination. Rear area supply point personnel can use subdued-visible-light when security considerations permit. Forward supply point personnel require electronic binoculars, infrared light sources, and metascopes. These aids assist operators in identifying vehicles and using dispensing equipment. Controls and valves are marked with fluorescent material to aid in the identification of the proper product. Containers are similarly marked. POL vehicles are equipped with infrared filters on headlights and drivers are provided electronic binoculars. The supply points require reduced visibility markers for traffic control through storage and dispensing areas.

c. Conduct of night operations has no direct impact on the security requirements of POL pipelines, hoselines, and tank farms. These facilities must be provided round-the-clock.

d. During periods of reduced visibility, maintenance requirements continue and special maintenance procedures are required. Maintenance crews and operators use subdued visible light in rear areas but are provided with night vision devices if work is performed forward of the rear areas. Metascopes are adequate for some operations; however, electronic binoculars with an infrared light source are used for tasks that require both hands. Maintenance crews use lightproof shelters that cover the work area when performing assembly work or maintenance on POL distribution facilities. When such shelters are used, however, provision must also be made for adequate ventilation to avoid inhalation injury to workers.

5-11. Supply of Ammunition

a. Operations at night normally develop an increase in the expenditure of ammunition. Night vision devices have increased capabilities for direct observation of small arms fire, better first-round hit potential of direct fire weapons, and more effective adjustment of artillery fire. In so doing they have done much to equalize day and night capability of weapons and ammunition requirements. Because of these capabilities the required supply rate can be expected to increase when night firing requirements for ammunition are added to those for day firing.

b. Night operations may result in increased requirements for barrier ammunition (mines, explosives, and pyrotechnics) for rear area elements.

c. The method of establishing requirements for and controlling issues of ammunition for night operations is the same as for support of day operations. Special munitions requirements for night operations are consolidated with requirements for day operations and forwarded through command channels as required supply rates. The appropriate command announces available supply rates and establishes credits.

d. Ammunition is normally furnished by means of supply point distribution. However during night operations, ammunition may be distributed wholly by the unit distribution method to reduce the movement of combat element supply vehicles. Whenever possible, ammunition required for the night operation should be placed in the hands of the users during the day, and nighttime issues should be restricted to emergencies.

e. Surveillance and maintenance activities are normally conducted during the day. Only those activities in direct support of the operations are conducted at night. Because of the diversity of weapons, marking systems are carefully controlled. Fluorescent tape and paint, embossed lettering, and bands of tape are useful in supply areas.

Section III. MAINTENANCE SUPPORT

5-12. General

The principles of maintenance support of night operations are the same as for day operations. The procedures may change to accommodate sustained operations and the increased volume of work requires intensified command emphasis on preventive maintenance programs.

a. Factors tending to increase maintenance requirements include damage incident to night movement; the increased quantities and additional requirements for more and different types of equipment to perform organizational maintenance under conditions of darkness; and the general effect of environmental factors. The significance of the maintenance task makes all practical measures to reduce maintenance requirements a primary concern of the commander.

b. Operational procedures for support of night operations require intensive planning to accomplish most heavy, outside type work during the day. Maximum use is made of lightproof and light suppressing shelters. Electronic binoculars with an infrared light source, and metascopes are required by contact teams operating in forward areas, whereas subdued visible light is used for work in the open in rear areas. Whenever possible, handling and issuing of bulky repair parts (i.e., engines and transmissions) are accomplished during the day; however, supply elements of maintenance units consider the procedures for night supply operations discussed in the paragraphs 5-5 through 5-11.

c. Equipment maintenance is performed at night provided adequate plans are made. Planning for maintenance support of night operations includes—

(1) Marking of tools and equipment for easy identification during periods of reduced visibility (e.g., fluorescent tape or paint).

(2) Preparing portable shelters that can be draped around the work area.

(3) Training in the use of night vision aids.

(4) Modification of light sets to provide subdued-visible-light.

(5) Training to provide detailed knowledge of equipment likely to be repaired.

(6) Provision of necessary technical literature.

d. Plans for security take into consideration the impact that diversion of manpower has on the total maintenance effort. Operations can be divided into shifts (e.g., 4 hours on maintenance, 4 hours on security, 4 hours for rest).

e. Training for night operations must be intensive. Technicians should be thoroughly night trained for specific items of equipment, and then assigned to these pieces of equipment during darkness.

5-13. Organizational Maintenance

a. Maintenance activities at night demand continuing command emphasis on the performance of preventive maintenance. Failure to properly perform organizational preventative maintenance at any time results in increased organization and direct support maintenance requirements. This increases the burden on direct support maintenance units which, in turn, jeopardizes accomplishment of their mission and the mission of the supported force.

b. Competent training and constant command supervision are essential to proper performance of organizational maintenance. Thorough inspection of equipment is performed during daylight hours, repairs are completed, and emergency repair parts requirements are estimated and prepositioned to support the night operation. Equipment that is beyond organizational repair capability (either time, capacity, or level of maintenance) is evacuated to the supporting direct support element as early as possible, preferably during daylight, so that the equipment can be repaired or exchanged by the time the night operation begins.

c. Organizational maintenance personnel normally perform only emergency repairs on equipment during hours of darkness. The repair should be only that necessary to return the equipment to a combat serviceable condition. Organizational maintenance of small

items of equipment, such as radios, small arms, and generators, is performed in lightproof vans or shelters. Visible light within shelters is closely controlled, using only the minimum subdued light that is required to do the job. Personnel performing emergency repairs outside of shelters in forward areas require electronic binoculars and an infrared light source in order to perform their work with any degree of efficiency. When practical, and the tactical situation permits, repairmen can use infrared night vision aids and light sources that are components of vehicles being repaired.

d. Additional security forces equipped with night vision devices are required for maintenance elements working in isolated areas. Crews remaining with equipment being repaired are used in the security force.

e. Recovery of disabled equipment may be extremely hazardous during night operations when visible light cannot be used. Each situation is evaluated to determine the amount and type of equipment required (e.g., tank recovery vehicles or wheeled wrecker) and, if visible light cannot be used, whether the recovery can be conducted using infrared light. In view of the hazardous nature of recovery operations involving heavy equipment and if use of visible light or infrared night vision devices is not permitted, recovery is normally delayed until daylight. When these conditions exist and are aggravated by possible loss of equipment to the enemy, night recovery hazards must be accepted and the task accomplished in the most discrete manner possible. See FM 20–22 for details on vehicle recovery operation.

f. Evacuation and repair parts procedures are the same as for day operations except that consideration is given to the need for additional security forces to escort supply and recovery vehicles.

5–14. Direct Support Maintenance

a. Direct support maintenance emphasizes on site repair by maintenance contact teams. Contact teams must be equipped with light cross-country vehicles which have night vision driving aids. Members of the contact team require electronic binoculars and an infrared light source to perform their duties. Night vision weapons sights are needed for local security of the area.

b. Rear area maintenance elements perform the more time consuming and complex repairs on equipment evacuated by forward elements and contact teams. A limited supply of operational readiness float items are stocked by rear area maintenance elements.

c. Rear area maintenance elements have a smaller requirement for night vision aids than the elements operating with the combat forces. Normally, they operate effectively using subdued-visible-light. However, plans must provide for night vision devices to be provided for rear area contact teams dispatched into restricted light areas.

5–15. General Support Maintenance

General support maintenance activities generally are not conducted in areas where night vision aids are required for maintenance. Local security of the area can be facilitated by use of night vision aids. Other aspects of general support maintenance are the same, taking into consideration the discussion on movements in paragraphs 5–26 through 5–32.

Section IV. MEDICAL SUPPORT

5–16. Medical Support in Rear Areas

Medical support of night operations is provided using the same principles that govern day operations. Medical support facilities outside of the immediate combat area operate in shelters that afford blackout capabilities. Night vision aids other than those generally required for security and movements are not needed.

5–17. Medical Support in Forward Areas

Medical support elements within the combat area require night vision aids for personnel working in the open (e.g., aidmen and ambulance drivers). Night vision devices facilitate the administration of first aid. In general, forward area medical personnel are provided the same night vision capability as the forces they are supporting.

Section V. MILITARY POLICE SUPPORT

5-18. General

a. The fundamentals of military police night operations are the same as for daylight operations. They are incorporated in all military police functions. Obviously, some difficulties and a decrease in effectiveness of personnel will exist during the hours of darkness. Therefore special emphasis on night techniques is required to offset such difficulties. In addition, greater stress is placed on simplicity of plans, on more effective control measures, and on flexibility of communications. Careful planning and preparation, to include intensive night training and rehearsals, also are necessary. In those units having a rear area protection mission, planning must include well defined and easily identified objectives. Passive and active security measures assume greater importance in the development of plans for the security of critical facilities, command posts, airfields, ammunition depots, and lines of communications.

b. Reduced visibility compounds the problems of control over circulation of personnel and vehicles, motor patrolling, security of traffic movements, custody and evacuation of prisoners of war, conduct of raids, control of antiguerrilla activities in the rear areas, and reduction of the mass damage effects of natural or manmade disasters. In particular, the necessity for military police patrolling and surveillance of lines of communications throughout the hours of darkness is an established requirement and is normally practiced in combat areas.

c. Regardless of types and areas of night operations, military police posts and patrols are often isolated. This adds to the psychological stresses experienced. Round-the-clock operations require that the individual military policeman adjusts to such stresses. Because of the normal isolation of the individual military policeman at night, his confidence in himself depends largely upon training and the capability of night vision aids to enable him to accomplish his tasks effectively.

d. The availability of night vision equipment increases operational efficiency, enhances the security of night movements, and facilitates a 24-hour military police capability. This equipment includes items to aid traffic control in combat and combat service support operations. For instance, military police vehicle patrols can operate with more security at night by using electronic binoculars and infrared filters on headlights and spotlights. Traffic control posts increase their night vision capability by using the image metascope, a handheld infrared viewing device employed to read maps and route schedules. The metascope, using its own or other IR light sources, has a limited range, night infrared signal capability. It may be employed to recognize approaching traffic at critical points along the main supply route (MSR) in the combat area. Such devices can be used to detect the approach of traffic, but are not used to make an identification from information normally provided the military police on movement schedules. Therefore, prearranged signals to accomplish identification are required and should be included in movement schedules or SOI. Personnel on the approaching vehicle receive a challenge signal from the military police traffic post which is answered from the vehicle. Arrangements such as these, using standard equipment are essential to effective operations of isolated military police teams at night. To prevent compromise and enemy use of these identification signals, they must be changed daily or more often as required.

5-19. Planning and Coordination

The procedures involved in planning and coordinating operations at night are the same as for daylight operations. The concept for the operation must be simple and clear, and it must be planned and coordinated in detail. If conditions permit, a rehearsal of duties may be necessary over similar terrain and under similar light conditions. The factors in *a* through *e* below must be thoroughly considered.

a. Scheduling. Support requirements should be evaluated to permit scheduling of adequate time for the accomplishment of those activities that require considerable amounts of time

during hours of reduced visibility.

b. Personnel and Equipment Requirements. Effective conduct of route security, convoy escort missions, and physical security posts require provision of increased personnel and equipment during the most critical hours of night operations. Provision is made to augment the numbers of MP machinegun equipped escorts, to provide critical armor protection for military police teams on traffic reconnaissance or convoy escort tasks, and to increase the effectiveness of physical security measures on the perimeter of a facility by the addition of foot patrols, sentry dogs, and anti-intrusion devices. Ready access to necessary safety equipment, warning equipment, traffic batons, flashlights, and other items such as night vision devices is mandatory. Use of such items is dependent upon the task to be accomplished and availability of such equipment. A minimum capability for self protection must be provided for to include equipment for the surveillance of approaches into unit areas or critical facilities.

c. Preparation. Preparation for night operations follows the same general pattern as for operations during the daytime. However, the use of illumination means from nonorganic sources, the planned relocation of military police posts to receive the protection of adjacent units, and other special night defensive measures will entail extensive coordination to insure the maximum benefit from available support. Field expedient illumination devices may be used to produce improvised means of limited area protective lighting. The material for such devices is usually available or accessible but must be planned for.

d. Briefing. Of primary concern in the preparation of the military policeman for his duties at night is the briefing that he receives. In general it should follow the organization outlined in FM 19–25, or other applicable functional manuals of the MF 19-series. Special emphasis must be ascribed to coordinating instructions with nonmilitary police units providing support to insure adequate control and unity of effort.

e. Illumination. There is a continuing requirement for illumination means as an aid to the conduct of all military police operations during periods of reduced visibility, particularly in stability operations. The provision of on-call illumination assists in coordination and control and increases the effectiveness of security measures established for the protection of installations. Airborne illumination systems, ground mounted and mobile searchlights, aerial flares, and illuminating rounds are all efficient adjuncts for overcoming disadvantages imposed by terrain and light conditions. For a detailed account of the use of battlefield illumination, flame fuel illumination and bursting and firing devices, see FM 20–33 and FM 20–60.

5–20. Training

Individual and unit training exercises must be planned and conducted in the application of night techniques to maintain proficiency in all military police functions. Darkness increases troop safety considerations. Personnel must receive special training to properly operate and maintain the applicable night surveillance equipment described in the applicable appendixes of this manual. Such basic techniques as hand signalling used to perform point control of traffic differ from daytime signals and must be learned thoroughly by military police and the drivers of vehicles. See FM 19–25 for detailed training considerations for military police traffic control. Such training as night driving, convoy escorts, traffic control, counterambush measures, motor patrolling and reconnaissance, checkpoint operations, VIP security, small unit tactics, and familiarization with weapons and firearms safety must all reflect consideration of night limitations. Additionally, the effects of terrain and atmospheric conditions on night observation should be understood by the individual military policeman in order to adjust to night operations. This is accomplished only through continued night training and practical application under varying conditions.

5–21. Physical Security

a. In a theater of operations the use of perimeter barriers to supplement security forces will be primarily dependent upon the tactical situation and the relative permanency

of the facility. The use of protective lighting for physical security purposes in an operational area is not always considered a primary security aid. It will be used usually when U.S. Forces enjoy continuous air superiority. However, an emergency lighting capability must be available in the event of an intrusion or other situation requiring the immediate lighting of an area. The addition of night viewing devices for security units will fill the gap that is left by not being able to employ protective lighting. Other aids and adjuncts to armed guards such as barriers, intrusion detection alarms, guard communications, sentry dogs, and flares may be incorporated into security plans to increase the effectiveness of guard forces during the hours of darkness.

b. All planned security measures must be employed so that they complement or supplement each other. In general, the vulnerability of installations to infiltration by enemy groups at night is relatively high. Dependent upon the criticality of the area being secured, planned security measures must be increased during the hours of darkness to continue a degree of protection approaching that maintained during daylight hours. Normally, this means that each segment of a perimeter must be under constant observation by guard posts at all times. Without the aid of night viewing devices the capability of the human eye to observe at night varies from approximately 0 meters to 100 meters dependent upon the amount of ambient light (starlight, moonlight) available. With night viewing devices with a range of at least 200 meters included as an integral part of each guard post, a perimeter can be established with each such post spaced approximately 150 to 175 meters apart under ideal terrain conditions. This space takes into consideration the maximum effective range of the U.S. Army rifle, the range of the surveillance devices that are available for the individual soldier's use, and the necessity for insuring mutually supporting fire and observation from two or more posts at a given target. With the inclusion of the man-portable radar with a range of at least 3,500 meters, the detection capability of the security forces is greatly increased. This latter device when placed around a given perimeter provides the security force ample reaction time to implement countermeasures such as the alert of reserve forces, and the provision of reaction fires and on-call illumination. The proper utilization of artificial illumination means facilitates the early detection of an intruding enemy. However, a major limitation of all such surveillance equipment is the need for line of sight between detector and target. Realization that the characteristics of the normal terrain or residual background light causes blind or masked areas along likely avenues of approach to the perimeter defenses is important. These areas can be observed by remote view night vision equipment or covered by anti-intrusion devices or walking security posts.

c. Patrols of the perimeter areas are particularly effective against the infiltration threat at night. The patrol safety is enhanced and its capability to observe can be extended by using night vision sights. For instance, the infrared image metascope, with its own or other IR light sources, has a limited night infrared signalling capability which may be used by such elements for homing on an infrared beacon or for the recognition of friendly security positions. Illumination may be used to assist patrols in night reconnaissance to cover such operations.

d. The use of aircraft at night for the surveillance of such facilities as POL pipelines, to forestall sabotage and pilferage or to patrol lines of communication is practical. Airborne illumination systems, mounted on either fixed or rotary wing aircraft, may be utilized in the direct illumination role for surveillance and reconnaissance, convoy escort, and search and rescue.

e. The majority of night escorts performed in the theater of operations are of a security nature. Areas of heavy enemy or guerrilla activity necessitate a larger number of MP escorts according to the estimated or known risk from activities. See FM 31–22 for a type road security classification system, some transportation movement security measures, and the military police role in counterguerrilla operations. The use of armored vehicles, wheeled or tracked, for such traffic escort operations

involving movements taking place during the hours of darkness or reduced visibility, may be advisable. The increased firepower and armor protection afforded by such vehicles are usually aids to the accomplishment of not only the escort mission but also the night control function. Security measures may also include irregular schedules for movement.

f. Ship and waterway security missions and the protection of trains can be more effectively performed with the aid of the various night surveillance devices available and adaptable for such use.

5–22. Traffic Control

a. The improved night mobility of Army units which enhances speed and dispersion clearly dictates the need for exceptionally responsive, precisely timed, and effective traffic control during the hours of darkness. The systems for controlling night traffic in the theater of operations are the same as for day operations. The means and techniques must be varied to compensate for the limitations of reduced visibility during the hours of darkness. The helmet-mounted electronic binocular permits night driving at normal speeds with little additional driver training. These and such other aids to observation as the individual weapon night vision sight permit the coverage of routes and timely observation when a radical change in traffic, road, or safety conditions is most likely to take place. Controls used or prepared for use at a defile under blackout conditions include the infrared signalling capability provided by the infrared image metascope.

b. Dependent upon the likelihood of enemy contact, the withdrawal or relocation of isolated traffic patrols, traffic control points, military police checkpoints, and roadblocks may be required at night in order to afford them the protection of nearby friendly forces.

c. Traffic control involves keeping the roads open for traffic. Securing land routes requires constant reconnaissance and surveillance to discover and eliminate mines, roadblocks, and ambushes. It is mandatory that units performing route security have a high probability of detecting and surviving ambushes. The night vision sight, individual weapons mounted, facilitates the use of machinegun mounted traffic patrols during the hours of darkness, thereby, providing a considerable degree of protection for the military police patrol. The number of motor patrols and the composition and armament of each patrol team is normally increased for night coverage routes.

5–23. Rear Area Protection (RAP)

a. A major contributing factor to vulnerability in the rear area is the relatively fixed nature of installation. Anything stable for a period of time can be reconnoitered for attack or infiltration by an enemy. Since the immediate objectives of insurgent forces are command and control facilities and critical logistical installations, such facilities are better protected if their tenant units have an organic capability for providing area protection at least on a short term basis pending arrival of combat units. Limitations imposed by reduced visibility usually provides the hostile element with the only means for eluding detection in rear areas and gaining access into protected areas. Night vision equipment aids security forces in countering this threat, particularly where protective lighting provisions are impractical. Night guard posts, patrols, and guard/sentry dog teams, equipped with such devices are necessary in any hostile environment. Generally, such equipment when properly employed reduces the necessity for additional static posts and provides present security forces with personal protection by reducing the advantages of concealment and surprise by a determined intruder. Guidance for the conduct of rear area protection in all conditions of visibility as provided in FM 45–1 (TEST), when coupled with the various security techniques and small-unit tactics discussed in FM 31–16 and in other parts of this manual, is considered adequate for night RAP operations. The area commander must determine the availability of night surveillance equipment as he organizes the area RAP task force.

b. Area damage control is a function of all units and encompasses a range of situations that vary widely in the degree of night opera-

tions capability that may be conducted by the commander. The ability of relief forces to perform tasks of rehabilitation, repair, and reconstruction during periods of reduced visibility, is generally dependent upon the availability of night vision aids. Essential equipment includes floodlights, general purpose searchlights, or other emergency light sources. For instance, vehicle lights are commonly utilized as a field expedient to enable medical evacuation by air. Medical personnel responsible for medical sorting, evacuation, and other essential services in damage control have their tasks facilitated with the use of image intensification devices.

5–24. Prisoner of War and Civilian Internee Operations

Security and control are two basic functions in these operations. The night efficiency of troops involved in both tasks is increased considerably by the use of night vision equipment. Evacuation of these personnel is expedited to clear the combat zone and prevention of escape or liberation at night is facilitated by use of such equipment as the electronic binocular and the night vision sight, individual weapons mounted. Extension of the range of visibility at night to near day levels permits greater security in the combat zone. This, in turn, permits more rapid evacuation to confinement facilities in the rear area. Division military police support in this functional area is the same for daytime or nighttime operations. The extent and scope of the provisions made to confine and transport prisoners of war and civilian internees is more flexible, with the aid of night surveillance devices, than before. The details of division and Army prisoner of war operations are published in FM 19–1 and FM 19–40.

5–25. Populace and Resources Control

Populace and resource control techniques are tailored to meet the needs of the situation. The fundamentals for such control operations at night are similar in all types of warfare. Normally, this mission is a part of joint U.S. Army military police/host country police stability operations and entails the control of the population and movement of material likely to be of benefit to the enemy. See FM 31–16 for special stability operations populace and resource control measures and FM 19–25 for checkpoint operations. The surveillance and control of the populace and resources in the theater of operations requires a capability to provide operational military police support round-the-clock. This capability is provided by consideration of, and planning for, proper employment of night vision and surveillance equipment.

Section VI. TRANSPORTATION SUPPORT

5–26. General

The transportation functions in the combat zone are basically the same for night operations as for day operations. As the ability of the ground combat units to conduct night operations increases, the demands on the supporting transportation systems probably will be increased. Although the total transportation requirements for a particular operation will not change appreciably, it can be expected that peakloads and time frames will be affected. In addition, because of the enemy's increased capabilities for ground and air observation, deep penetration, infiltration into the combat zone, and conducting guerrilla warfare on a large scale, the light line may of necessity be moved far to the rear. This will increase the requirement for transportation units to employ night vision devices to sustain operations. The decision on what degree of illumination transportation elements will employ is based on the intelligence estimates of the enemy's capability for detection.

5–27. Movement Control

a. As the capability of the combat elements to conduct night operations improves, the demand for efficient movement control increases. Shortened times required to conduct specific combat operations place increased short term demands on available transportation. Therefore, it is increasingly essential that movement

control personnel at all levels insure that the most efficient use is made of all available transportation. When air superiority is not established, movement control personnel must promote security and passive defense by scheduling movements during hours of darkness.

b. Use of night vision devices can greatly improve the efficiency of movement control personnel operating where invisible illumination is permitted.

(1) *Highway regulation points.* The use of electronic binoculars and infrared filtered spotlights aid highway regulation point personnel in viewing convoy identification markings. This eliminates the need to stop each convoy as is required under complete blackout conditions.

(2) *Air terminals.* Movement control personnel equipped with the starlight scope and an infrared light source at air terminals are able to more readily identify tail numbers of arriving and departing aircraft, thus eliminating the necessity for personal contact with aircraft crews. When equipped with electronic binoculars and an infrared light source, these personnel can more easily identify cargo as it arrives and departs, thus decreasing delays and improper routing of cargo.

5-28. Motor Transport

a. Light Conditions. The determination of the conditions under which military traffic moves at night is a command function. The enemy threat, and, so far as possible, the regulations of the host country are considered when deciding whether artificial light is to be visible, invisible, or blacked out.

b. Night Vision Aids. The movement of vehicles at night is largely dependent on the ability of the operator to see. Restrictions on the use of visible light in the combat area slow the movement of supplies. In many cases vehicles must be led by a person on foot in order that drivers do not become lost or involved in accidents. With night vision equipment, vehicle operators have the capability of extending their range of vision sufficiently to operate vehicles at near daylight speeds. In addition, they are able to remain oriented, maintain convoy integrity, avoid accidents, and be relatively free of direct enemy observation.

c. Advantages of Night Vision Aids. Night vision equipment thus can materially aid motor transport units in the performances of their mission. Ease of operation and increased vehicle speeds at night expedite deliveries of supplies and personnel. This increase in transport efficiency not only permits commanders to respond more quickly in a given situation but, in turn, means more work being accomplished by the same number of vehicles and operators in the same time period. A bonus effect accruing to the motor transport unit is that vehicles can be loaded and unloaded more quickly by personnel equipped with night vision devices, thereby decreasing turnaround time.

d. Land Navigation System. When available, the position and direction indicating system, called the land navigation set (LNS), adds to the capabilities of the motor transport unit. When employed in at least one vehicle in each convoy, this system keeps the convoy oriented on the right route thus minimizing the possibility of delays.

e. Training.

(1) The efficient use of night vision devices by motor transport units is greatly dependent on the degree of training of the users.

(2) Electronic binoculars place the driver in a completely new environment. Training will permit the driver to adjust to the addition of one to two pounds of weight to his headgear and visual differences. His field of view and depth of field are greatly reduced compared with driving with visible lights. Although there is no magnification in these binoculars, the tunnel effect may cause the driver to experience headaches and increased eye fatigue when driving with electronic binoculars for extended periods. He is also working in a green world; therefore, the normal association of colors in object identification is of no value to him.

(3) Through proper orientation, training, and use, drivers are expected to overcome most of the problems encountered in using electronic binoculars within 1 to 2 weeks. Emphasis is placed on proper interpretation of what is seen, proper development of safe driving tech-

niques, proper adjustment of headgear and eyepieces, and proper maintenance of night vision equipment.

f. Standing Operating Procedures. Unit SOP must include procedures for moving vehicles at night under visible, invisible, and blackout artificial illumination. These procedures must include the employment of night vision devices, safe operating techniques, and plans for operator training.

g. Convoy Operations.

(1) *Method of movement.* Normally, the close column is used in night moves under blackout conditions. Roads are normally limited to one-way traffic. The rate of march is approximately 16 kilometers in the hour. Vehicles in close column are grouped compactly to reduce road space, to improve control and communication, and to reduce guide requirements.

(2) *Two-way traffic.* With the use of night vision devices, convoy columns are opened up, vehicle speeds are increased, and, when first class roads are available, two-way traffic may be practicable.

(3) *Use of night vision devices in convoy operations.*

(*a*) When invisible illumination is permitted, all vehicle headlights and taillights are covered with infrared filters. All vehicle operators must wear electronic binoculars.

(*b*) Observers in lead and escort vehicles can effectively employ the starlight scope to increase their ability to follow the proper route and detect obstacles, roadblocks, enemy ambushes, and other potential hazards.

(*c*) Vehicle-mounted Xenon searchlights can be placed in various positions in the column to increase the usefulness of the starlight scope and electronic binoculars.

(*d*) Spotlights and floodlights mounted on wreckers should be covered with infrared filters. Wrecker operators and maintenance personnel should be equipped with electronic binoculars. This equipment assists in making roadside repairs, accomplishing accident procedures, and evacuating disabled vehicles.

(*e*) Emphasis is on procedures and signals to be used by vehicles that drop out of a column to insure that the following vehicles continue to march.

(*f*) Road guides equipped with night vision devices can more readily identify particular columns when prearranged signals are employed.

(*g*) Vehicular-mounted weapons and escort forces equipped with starlight scope individual weapons sights greatly enhance the convoy defensive posture both on the move and at halts.

h. Transfer Points. Motor transport truck terminals and trailer transfer points employ night vision devices to improve the efficiency of their operations and their defensive perimeters. Infrared filtered floodlights at entrances and exits aid checkers and dispatchers in performing their missions when this type of illumination can be used. Maintenance teams equipped with electronic binoculars and infrared filtered lanterns are able to more efficiently make emergency repairs. The use of night vision devices in the perimeter defenses of these installations is discussed in chapter 14.

5–29. Military Rail Service

a. The operation of military railroads does not change appreciably where night vision devices are substituted for conventional white light. The actual requirement for lights for night operation is limited to signaling. All conventional white light signaling devices can be covered with infrared filters and viewed with electronic binoculars. The substitution of infrared filtered lights for colored light signals on an entire rail system is impractical. When the tactical situation requires train operation with blackout or invisible illumination, increased use of radio or oral communications are required where colored light signals are normally used. An important use for infrared filtered light is on trains operating in a permissive block system. In this situation, high powered infrared filtered lights are required on the aft end of the last car in each train and at least one observer wearing electronic binoculars is required in the cab of each engine.

b. Other uses can be made of night vision devices in the rail service. These generally do not affect the overall operation of the service but provide safety and promote efficiency of

the operating personnel. Train signalmen using infrared filtered electronic lanterns and electronic binoculars also use this equipment for making spot inspections and minor repairs where visible illumination is not permitted. Infrared filters can be placed on engine headlights and electronic binoculars may be worn by engineers to reduce the psychological problems of inexperienced crewmen running under blackout conditions. Where security forces are employed, night vision weapons sights are used in the same manner as described in chapter 12.

5-30. Army Air Transport

Army air transport units have the capability of performing night logistical operations using a very minimum of visible light. Present night vision devices are not readily adaptable for use by Army aircraft in the performance of their logistical mission. Ground times are appreciably reduced, however, when ground support and air terminal personnel employ night vision devices. This is required where restrictions are placed on the use of visible light.

5-31. Watercraft

With the use of night vision devices, transportation watercraft operations can be conducted with only slightly reduced efficiency compared to operations using visible light. Night vision devices are employed with three categories of watercraft—harbor craft, landing craft, and amphibians.

a. Harbor Craft.

(1) *Tugboats.* The use of night vision devices in tugboat operations is primarily limited to long haul tow operations. The use of radar and the starlight scope by lookouts increases the safety and security of these operations. The use of tugboats in berthing operations is usually limited to daylight, however operational necessity dictates that berthing operations will at times be conducted at night when visible light is permissible. The movement of tugboats within the harbor or between ports is conducted with greater safety and efficiency using image intensification and infrared night viewing equipment.

(2) *Patrol boats.* The use of night vision devices in patrol boat or picketboat operation greatly improves the safety, efficiency, and effectiveness of these operations when restrictions are placed on the use of visible light. Patrol boat spotlights and running lights are covered with infrared filters. Boat crewmen are equipped with electronic binoculars and use infrared filtered lights for illumination. Starlight scopes employed by lookouts increase their ability to perform their mission. Starlight scopes used on the individual weapons and machineguns of the onboard military police personnel enhance their ability to detect, identify, and engage guerrillas, saboteurs, and enemy agents.

(3) *Floating cranes.* The use of night vision devices in floating crane operations is similar to that of the terminal service unit in stevedoring operations. Infrared filters are placed over all spotlights and floodlights. Crane operators and signalmen are equipped with electronic binoculars. Efficiency of crane operations is reduced when invisible light is used; however, work that would normally cease under blackout can be continued with a relative degree of safety.

b. Landing Craft.

(1) Daily tonnage capabilities of landing craft units are based on round-the-clock operations. Restrictions on the use of visible light under combat conditions serve to reduce these daily capabilities. Landing craft units are able to operate with only slightly reduced efficiency at night, using night vision aids.

(2) SOP of landing craft units must include procedures for operating at night under visible and invisible illumination. These procedures must include the employment of night vision devices, safe operating techniques, and plans for operator training.

(3) The requirements for training of landing craft unit personnel in the use of night vision devices are as discussed in paragraph 5-28.

(4) Ship discharge operations can be conducted by landing craft using night vision devices with a relative degree of safety where invisible illumination is permitted. The running lights of landing craft are covered with infrared filters. These filters will eliminate the color, where red indicates port and green starboard. To compensate for this, measures must

be taken to identify a vessel properly. Two lights could be mounted to indicate the starboard side and one for port. Operators are equipped with electronic binoculars. A lookout on each craft is equipped with a starlight scope. Infrared filters are required on marker buoys along the traffic lanes between the ship and shore. A control boat, stationed between the inbound and outbound lanes about midway from ship to shore is required. The control boat should be equipped with tripod mounted night vision sights (NOD) and radar to assist in locating distressed landing craft. Infrared filter lights are also required at shipside to identify landing craft mooring points. If landing craft are operating in conjunction with amphibians, separate markers must be used at shipside to distinguish between landing craft and amphibian mooring points. Separate traffic lanes are used for movement between ship and shore. An infrared filtered high-powered light can be placed on the ship's mast facing the shore to be used as a beacon to guide landing craft to the ship.

(5) Night movements of landing craft by convoy are conducted with slightly reduced efficiency using night vision devices when visible light is prohibited. Starlight scopes are employed by lookouts to maintain position and avoid collisions. The lead vessel employs lookouts using starlight scopes to avoid obstacles. As in any night convoy operation, increased emphasis must be placed on accurate navigation. Radar and radio navigational aids should be employed when available.

c. Amphibians.

(1) Amphibians operate in water essentially the same as landing craft (*b* above) and on land essentially the same as motor vehicles (para 5–28). However, some additional aspects must be considered.

(2) When amphibians use separate water exit and entrance points at the beach, each site requires different infrared markers to control traffic when approaching the shore from the ship. One-way traffic is required on roads between the shore and holding areas. Roadways must be well marked to prevent accidents and to prevent vehicles from becoming lost.

5–32. Transportation Terminal Operations

Terminal operations are conducted on a round-the-clock basis. During the hours of darkness, floodlighting systems are used aboard ships in protected harbors, on piers, in holding areas, and at inland terminals wherever the enemy situation permits. When the ship berths are directly visible from the sea, as in over-the-shore operations, and when friendly forces cannot maintain air superiority, increased light discipline may be required. In these cases, personnel are equipped with light intensification devices or electronic binoculars. Infrared filters are placed over all floodlights, headlights, and taillights of vehicles, forklift trucks, tractors, and amphibians. Luminescent materials, such as paint and tape, should be applied to cargo and equipment to enhance visibility and identification. Terminal service personnel performing duties use night vision devices to aid in identification of lighters, amphibians, and cargo. The effective use of these devices facilitates the flow of goods through ports and beaches where standard checking procedures under blackout conditions would normally delay operations. Night vision aids are used in ports, beach terminals, and inland terminals when enemy action prevents the use of ordinary lighting equipment. The training requirements are discussed in paragraph 5–28. Emphasis must be placed on safe night operation of stevedoring and materials handling equipment.

PART THREE
NIGHT OFFENSIVE OPERATIONS
CHAPTER 6
INTRODUCTION TO NIGHT OFFENSIVE OPERATIONS

6-1. General

Combat at night or under conditions of reduced visibility is characterized by a reduced ability to place aimed fire on the enemy; a corresponding increase in the importance of close combat, volume of fire, and the fires of fixed weapons which are laid on definite targets or target areas; difficulty in movement; and difficulty in the maintenance of control, direction, and contact. The considerations for organizing forces at night are no different than those used in daytime. As the limitations imposed by the environment are reduced or removed by the use of night vision devices or battlefield illumination, the more closely night attacks will resemble those conducted in daylight. As a minimum, control measures employed in daytime tactical operations are also employed at night.

6-2. Purpose of Night Offensive Operations

Night attacks are used to: hasten accomplishment of mission; continue an action begun but not finished during daylight; exploit a success made during daylight; retain the initiative; keep continual pressure on enemy forces, avoid loss of contact and thereby prevent reorganization of his forces, reestablishment of his communications, and the preparation of defensive positions; avoid heavy losses by crossing terrain at night which predominately favors the defense as a result of a lack of cover and concealment for the attacker, or because of other terrain considerations; achieve surprise; fix enemy reserves or cause their commitment prematurely; and to compensate for an enemy with air or ground superiority. Few of these actions are peculiar to night actions alone. The maintenance of momentum, retention of the initiative, and early accomplishment of a mission apply to all offensive operations.

6-3. Planning

a. Previous restrictions on night offensive operations were mainly due to the inability to see. Night operating aids, which include night vision devices employed in conjunction with navigational and surveillance aids, provide a much improved capability to conduct tactical operations during darkness. Techniques for planning a night attack are very similar to those employed in a daylight attack. Dispersion remains important. Unit integrity must be maintained. Problems resulting from continuous combat operations must be recognized, considered, and provisions made to provide relief prior to unacceptable losses in combat effectiveness. If the objective is relatively deep or the unit's mission requires immediate continuation, the attack should begin early at night, breach initial defenses with dismounted forces, and continue to the final objective by exploiting with highly mechanized forces, if available, during darkness. Where the pressure of forward movement and fire is relentless, the tactical advantages and adverse effects on the enemy morale pyramids. There is no pause in the pressure exerted by the attacker; rather, rested infantry units are committed around or through units in contact at night to preclude the enemy from gaining the initiative.

b. As a general rule the following prerequisites are necessary for successful night operations:

(1) Detailed planning and preparation.

(2) Detailed information of terrain, enemy, weather conditions and illumination levels.

(3) Secrecy and surprise.
(4) Detailed orders and simplified schemes of maneuver.
(5) Easily identifiable objectives.
(6) Requirements for close control.
(7) Special recognition and reporting procedures, particularly where secrecy in the attack is to be preserved.
(8) Logistical support.
(9) Deception.

c. Surprise and secrecy are attained more easily at night than in the daylight, but the achievement of these advantages requires stricter adherence to the principles of secrecy. Concealed routes of approach and deception measures are used as much as possible to prevent premature disclosure of the attack.

6–4. Maneuver

The battalion or task force commander employs enough combat forces forward to enable assaulting units to clear assigned objectives in the initial assault. Complicated maneuvers are avoided. Company and platoon objectives are delineated and assigned so they are recognizable at night with a medium range night observation device (app J). A zone of action may be designated for each attacking company or a direction of attack may be established. Directions of attack are more restrictive and are located along a recognizable terrain feature, an azimuth, or both. With available night operating aids, the absence of these control measures should not preclude the execution of a successful night attack since visual coordination between units is possible. Nevertheless, the maneuver is simplified and control more positive when all necessary control measures are planned and available for execution if needed.

6–5. Fire Support Plan

Fire support plans for night attacks are similar to those for daylight attacks. Illumination is provided in accordance with the night visibility plan. Methods for controlling supporting weapons and their fires when direct illumination is used, are identical to those in a daylight attack. When partial or no illumination is provided, special restrictions are imposed upon the movement of weapons and the initiation and shifting of supporting fires. However, when weapons are moved and fires are shifted, these actions are controlled with night viewing devices. When a night attack is made to achieve surprise, the commander announces the conditions under which supporting weapons will fire. If the attack is discovered after the assault has been launched, supporting fires are placed on the objective, beyond it, or on its flanks, as appropriate. When nuclear fires are employed, careful consideration must be given to troop safety, to the resultant effects of a possible loss of night vision through dazzle effects, and to the creation of obstacles to the attacking force. The advantages to be gained from nuclear weapons should definitely outweigh the known disadvantages prior to a decision to use them.

CHAPTER 7
INFANTRY FORCES IN THE NIGHT ATTACK

Section I. GENERAL

7–1. General
Offensive operations during periods of limited visibility are frequent and should be considered an integral part of all operations. Reduced visibility caused by night, fog, smoke, haze, and dust hampers the enemy's ability to defend. Therefore, attacks at night and during periods of reduced visibility often give the attacker a distinct psychological advantage. Surprise may often be achieved at night when surprise is not possible during daylight operation. Available night vision devices, such as infrared and image intensification devices used in combination with radar and surveillance devices enhance the chance for success. The method of employment of these night operating aids is contained in the night visibility plan (NVP).

7–2. Reasons for Night Attack
Night attacks may be used to continue the momentum gained by a successful daylight attack, to gain surprise, to mass a superior force under the cover of darkness, and to reduce the effectiveness of enemy fires.

7–3. Control
During periods of reduced visibility, more restrictive control measures must be used. The specific control measures used are discussed in detail in paragraph 7–6.

7–4. Methods of Night Attack
There are two methods of conducting a night attack: illuminated and nonilluminated. The particular method(s) employed depend on such tactical considerations as the enemy strength and degree of preparation of his defensive positions, his security measures, the terrain, the light conditions, and the illumination means available. The nonilluminated attack is made to achieve surprise in closing with the enemy before he discovers the attack. The illuminated attack is made when the enemy position is strong, when the possibility of achieving surprise is remote, and when control of the unit requires use of daylight control methods. Fire support is always planned and used at the direction of the commander.

Section II. INFANTRY BATTALION

7–5. Basic Considerations of Night Attack
a. Plans for night attacks are more detailed and less flexible than for daylight operations. The emphasis is on simple, easy-to-execute formations and maneuver. Planning is centralized and execution is decentralized.

b. To successfully achieve the element of surprise, secrecy and stealth are essential. Deceptive measures must be taken to keep the enemy from discovering the time and direction of attack. Light and noise discipline must be established and maintained.

c. Although well trained units can execute night attacks on short notice, planning and troop leading procedures for a night attack are generally more extensive and time consuming than for a similar daylight attack. Consequently, it is essential that troops are thoroughly briefed on the final plans and rehearsed on the operation if time permits.

d. Preparatory fires are not normally used in a nonilluminated night attack. Every effort is made to maintain the existing pattern of fires prior to and during the attack. In deter-

mining whether a preparation will be fired, its probable assistance to the maneuver force must be weighed against the effects of tactical surprise resulting from an attack by stealth. If a preparation is not fired, on-call fires are planned to be used in the event the attack is discovered. In addition to normal fires, fires are planned to cut off the withdrawal of the defending enemy force, to protect the flanks of the maneuver force in the attack, and to cover the reorganization on the objective.

e. Illumination is planned and may be used throughout the attack or on an on-call basis after secrecy has been lost. Plans should include provision for all available types of illumination, including tank searchlights, artillery and mortar illumination, and flars delivered by aircraft. The use of illumination must be carefully coordinated to avoid detrimental effects on units in adjacent areas.

f. Radio listening silence is maintained as long as possible as a security measure. Initially, the primary means of communications are wire and messengers. Once the attack is discovered, normal communications are used, but held to the minimum, and pre-arranged pyrotechnic signals may also be employed.

7–6. Planning and Preparation

a. General. Troop leading procedures and techniques for planning a night attack are similar to those for planning a daylight attack. However, detailed planning with a simplified scheme of maneuver is required for a night attack.

b. Reconnaissance. If possible, battalion planning should allow subordinate commanders adequate time to conduct a daylight, dusk, and night reconnaissance of the operational area.

c. Surprise and Secrecy. In conducting a night attack, surprise is gained through secrecy and stealth. Measures taken include—

(1) Restricting the size and time of parties engaged in reconnaissance and other preparations.

(2) Continuing the normal pattern of artillery and mortar fire in the area of operations.

(3) Conducting local attacks in areas not designated for the night attack.

(4) Attacking at a time and from a direction heretofore not used against the enemy. Standard patterns, including methods of attack, are avoided.

(5) Illuminating areas other than the attack area to deceive or mislead the enemy.

(6) Imposing radio listening silence at least until reaching the probable line of deployment and, if possible, until the attack has been discovered. Thereafter insure use of good signal security practice.

(7) Conducting the attack without artificial illumination until the attacking force is exposed to effective enemy fires or until the enemy illuminates.

(8) Planning for and making maximum use of the night vision devices organic to the infantry battalion.

d. Control Measures. The following control measures are planned for and used by the infantry battalion in the night attack (fig. 7–1).

(1) *General.* Assembly areas, attack positions, line of departure, probable line of deployment, contact points, boundaries, direction of attack, and objectives are principal night attack control measures. They are used in the same manner as in the daylight attack. Discussion of daylight attack is contained in FM 7–20.

(2) *Release points (RP).* The company RP is a point at which the battalion commander releases control of the company to its commander. This control measure must be easily recognized in the dark and may be marked by artificial means. It is to the rear of the line of departure (LD) unless the battalion commander elects to cross the LD in a column of companies. This may be done to facilitate control while advancing to a deep objective.

(3) *The probable line of deployment (PLD).* PLD is the terrain location selected in planning where attacking units deploy before launching the assault. Although placement of the PLD beyond existing obstacles (wire and mines) is desirable, it may not be practical. If obstacles cannot be breached without detection the PLD may be placed to the friendly side of the obstacles. In selecting the PLD, the commander considers the nature of the terrain, enemy dispositions to include the location

of enemy security elements, and the enemy techniques of operation. The PLD should be an easily recognizable terrain feature, be within assaulting distance of the objective, and be capable of being marked by artificial means and/or friendly security patrols.

(4) *Limit of advance (LA).* An LA is planned for troop safety by limiting the forward advance of attacking troops. It must be easily recognized in the dark and far enough beyond the objective to allow forward friendly security forces space in which to operate. It is also employed to coordinate and control supporting fires.

(5) *Night operating aids.* Night operating aids which may be used include special means for identifying friendly troops such as white or luminous marking on the outer uniform, filtered or colored flashlight used for recognition, or other signals. The use of passive night vision equipment and surveillance devices is planned by each commander to assist in the observation and surveillance of the battlefield. This information is contained in the NVP. The equipment is well suited to operations requiring stealth and secrecy, and significantly increases the commander's influence and flexibility during periods of limited visibility.

e. Illumination.

(1) Plans are made for employing available illumination, even if the attack plan calls for the objective to be seized by stealth. Planned phasing of illumination is included in the NVP. If there is little or no chance of surprising the enemy, artificial illumination may be used as soon as the maneuver force crosses the LD. If surprise can be gained, illumination is withheld until the attack has been discovered or until the enemy places effective fire upon the attacker.

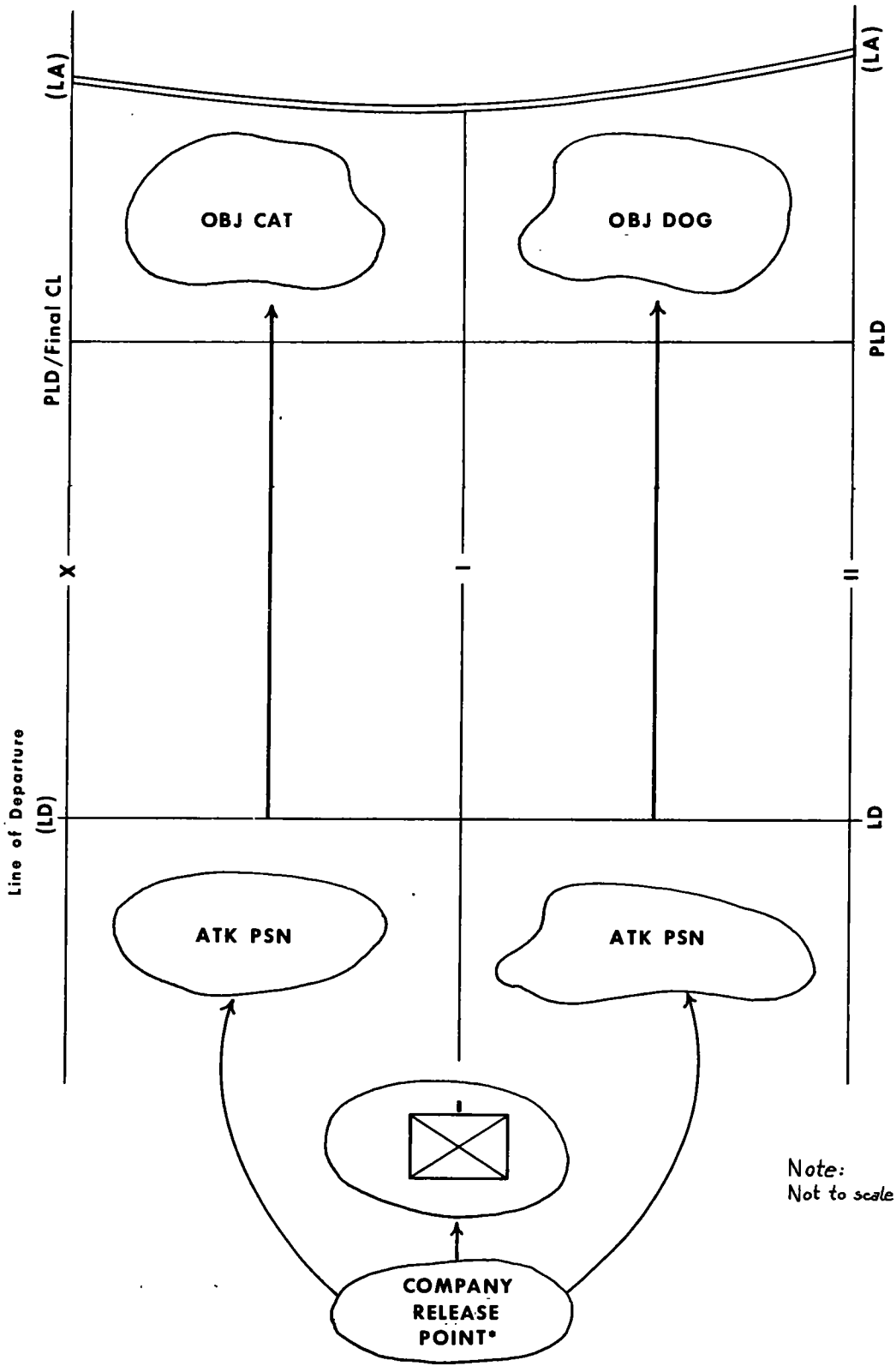
(2) A portion of the battalion zone may be illuminated, while other portions are not. An enveloping force may move under cover of darkness with the aid of passive night vision equipment, while the supporting attack is conducted with illumination.

(3) Use of active (infrared) and passive night vision devices has a definite psychological effect on the enemy. He may not be able to visually detect the weapons from which he is receiving effective aimed fire.

(4) When the attack is discovered, all means of illumination are employed if they assist the attacker. Some of these means are tank and artillery searchlights, flares, and illumination rounds, delivered by ground and aerial means. Indirect illumination may be placed on the objective following the assault to assist in the consolidation and reorganization. The commander must realize that the same advantage that illumination provides to his force is also provided to the enemy. He must weigh this against the alternatives of ceasing illumination, and completing his consolidation and reorganization assisted by use of the available passive night vision devices.

f. Fire Support Plan. Fire support and the method of controlling it during an illuminated attack are identical to those used in the daylight attack. When partial or no illumination is employed, indirect fires are planned and registered to strike known targets on the objective, to protect the flanks of the maneuver unit, and to isolate the objective. The pattern of fires existing prior to the attack is maintained. Normally the commander will fire on enemy nuclear delivery and night vision means located during the attack. When a night attack is made to achieve surprise, the commander defines the conditions under which supporting weapons are to be fired.

g. Communication. Normal radio traffic is maintained prior to the attack but no mention of the attack is made in the clear until the actual attack has been discovered. After attacking units cross the LD, radio listening silence is maintained in the attacking echelon, but normal traffic is continued by units located along the line of contact. Wire is the primary means of communication for dismounted attack elements, prior to discovery, when its use is feasible. After the attack is disclosed, radio becomes the primary means of communication. Even though radio becomes the primary means of communications, extreme care must be exercised to insure that information which could be of immediate use to the enemy is not passed in the clear. If a reserve or new unit(s) is committed to a night attack through a unit(s) in contact, the at-



*Control is released to company commanders at this point.

Figure 7–1. Night attack with two companies attacking (schematic).

tacking unit(s) maintains listening silence until its movement is discovered.

7–7. Scheme of Maneuver

The battalion commander employs enough combat power forward to enable assaulting units to clear assigned objectives in the initial assault. Simple schemes of maneuver are planned for night attacks wherever practicable. This does not preclude the conduct of shallow flank attacks at night when the terrain and situation permit.

a. Formations. The formations used for the illuminated night attack are identical to those used in daylight attack. When conducting a nonilluminated attack, the battalion normally uses the line formation in crossing the LD at the points of departure (when the company RP is located to the rear of the LD). If the terrain and situation dictate that the company release point be located forward of the LD, the battalion uses the column formation until it reaches the company release point. The battalion deploys into the line formation at the PLD, with all subordinate units on line.

b. Distribution of Forces in the Night Attack. During the night attack, the commander must allocate the proper amount of combat power to support the scheme of maneuver. For night attacks, the commander normally uses a maneuver force; a base of observation, illumination, and fire (BOIF) force; and a reserve element.

(1) The maneuver force of the infantry battalion is composed of the rifle companies, attached tank companies, and the battalion reconnaissance platoon. The scheme of maneuver is the plan for the placement and movement of these maneuver forces to accomplish their assigned mission. In planning the night attack, company objectives are clearly delineated. They must be easily recognized at night. A zone of action is designated for each attacking company. A direction of attack may be established along a recognizable terrain feature, or an azimuth, or both.

(2) To increase the capabilities of night observation and control, the battalion plans and employs a BOIF. This includes the planning and use of night operating aids such as starlight scopes night observation devices, infrared weapon sights, metascopes, electronic binoculars, searchlights, illuminating rounds, and surveillance radars. Planning for supporting fires for the night attack is discussed in paragraph 7–6.

(3) A rifle company may be retained as the battalion reserve. The reserve is prepared to assume the mission of an attacking company at any time. Normally, the reserve is not committed in an area where it may become involved with other attacking companies unless illumination or other night operating aids are used to prevent possible engagements between friendly units. The reserve may be used to continue the attack once initial objectives have been seized or committed around leading elements which have become engaged.

(4) When secrecy is desired, tanks and personnel carriers must be employed with care in the attacking echelon. The mass movement of tanks and personnel carriers may compromise secrecy; however, where the enemy situation permits their employment to within feasible distances of enemy dispositions without compromising the attack, their employment to provide a combined arms capability and to preserve troop strength is desirable, where possible. If the terrain and light conditions permit, and if the need for tank support during the assault and consolidation outweighs the necessity for secrecy, tanks may be attached to the attack echelon. Usually, tanks remain in position behind the LD and fire at designated targets on call. They may exploit through the attacking infantry elements as soon as practicable after intermediate antitank resistance has been eliminated. For details concerning employment of tank-mounted searchlights and infrared devices, see chapter 10.

(5) *Antitank squads of the antitank platoon* may remain in the vicinity of the LD in preselected firing positions, prepared to fire or displace on order. Illumination is required for use of the antitank missiles. Plans are prepared for the attachment of antitank squads to companies in whose areas enemy tank threats are likely to develop. Light and medium antitank weapons are carried by attacking infantry elements to provide support

against enemy tanks encountered at close range.

(6) General support is the preferred method of employing the *heavy mortar platoon* in the night attack. The fires of the mortars are planned for a night attack in essentially the same manner as for a daylight attack. For attacks using stealth, preparatory fires are not normally used. Normal rates of harassing and interdictory fires are maintained until the attack is discovered or secrecy is no longer necessary.

(7) The *reconnaissance platoon* may be employed initially in a maneuver force security role with contingency missions, such as flank security, being executed on order (usually after contact with enemy forces). The maximum use of night operating aids is made to accomplish the reconnaissance and security mission.

(8) The battalion *ground surveillance section* may be employed well forward and on the flanks to determine the location and progress of the attacking force, to provide information for use in guiding forces, and to locate changes in enemy dispositions prior to and during the assault.

c. Time of Attack. Time patterns are avoided so that the enemy cannot predict the time of attack. Often an attack is made late at night so that initial objectives can be seized by daylight and the attack continued at that time. If the objective is relatively deep, or if the battalion mission requires immediate continuation of the attack, the attack may begin early at night, seizing the initial objective by dismounted action using stealth, and continuing to the final objective during darkness with a mobile force. If the objective is to be seized and held, the attack may begin early at night with the consolidation and reorganization on the objective taking place in darkness.

7–8. Conduct of the Attack

The conduct of the attack begins as the battalion crosses the LD and starts the move to the PLD. Commanders are well forward to insure aggressive movement of their units, maintenance of direction, and coordination with other units to include the BOIF force.

a. Security Units. Reconnaissance patrols which have gathered information before the attack, may be used during the attack as members of frontal and flank security detachments to mark routes forward of the LD, to mark the PLD, and to guide attacking units during their movement from the LD to the PLD. Security elements may be used forward of the LD to prevent discovery of the attack prior to arrival at the PLD.

b. Advance to Probable Line of Deployment. During a nonilluminated attack, attacking companies advance silently in columns forward of the LD. The previous pattern of night fires is maintained to assist in concealing their movement. From platoon and squad RP, units move to the PLD, deploy, and prepare to continue the advance at a predesignated time or in response to a given signal. When the advance is resumed, the attacking echelon moves forward silently until discovered by the enemy; then it begins the assault.

(1) If an enemy outpost or patrol is encountered during the movement forward from the LD, leading elements of the column assist security patrols in disposing of it as quickly as possible. If the attack is prematurely discovered, the engaged company commander may launch the assault on his own initiative.

(2) If the PLD is located beyond an obstacle, plans are included for breaching the obstacle. If the PLD is located on the near side of an obstacle, the obstacle is breached by explosives or other means at the beginning of the assault.

c. Assault. When the assault begins, all assaulting troops advance as quickly as possible. Flares, searchlights, and other illuminating and night operating devices such as individual weapon sights may be used to allow assaulting troops to place aimed fire on the enemy and to move at a more rapid rate.

7–9. Actions on the Objective

Consolidation and reorganization begins as soon as the objective has been captured. Consideration must be given to the use of night vision devices during the consolidation and reorganization. This is necessary because the attacking unit will suffer from night blindness for about 30 minutes after extinguishing visi-

ble lights. Simultaneously, during the consolidation and reorganization, security elements are deployed far enough forward to warn of enemy forces forming for a counterattack. Direct fire weapons are displaced to the objective and artillery and mortar forward observers (FO) plan defensive fires as soon as possible. The subordinate units complete their consolidation and reorganization as rapidly as possible while the battalion prepares plans for future operations.

Section III. INFANTRY RIFLE COMPANY

7–10. General

This section discusses the doctrinal procedures and techniques applicable at the infantry rifle company level only. It must be used in conjunction with the other material prescribed in this chapter.

7–11. Basic Considerations

The consideration for the rifle company conducting the night attack are essentially the same as the infantry battalion. For detailed discussion, see paragraphs 7–5 through 7–9 and FM 7–11.

7–12. Planning and Preparation

a. General. Although the plan for night or limited visibility attack should be as simple as possible, the attack order may be lengthy and detailed because of the unusual number of specific control measures and special instructions which are necessary. The plan for a night attack should include preparation, employment, distribution, and maintenance of night vision devices and surveillance equipment.

b. Reconnaissance. If possible, all leaders reconnoiter during daylight, dusk, and darkness. Reconnoitering during different conditions of light assures maximum familiarity with the terrain. The company commander normally limits the size of reconnaissance patrols and prescribes other limitations on reconnaissance essential to the maintenance of secrecy. Night operating aids should be used to assist in reconnaissance and to detect the enemy use of such equipment.

c. Surprise and Secrecy. Positive measures are taken to insure secrecy and increase the probability of surprise. In addition to limitations on reconnaissance patrolling, the movement of vehicles and weapons is held to a minimum. Light and noise discipline is rigidly enforced. Registration of weapons is avoided or accomplished in a way which does not indicate intentions to the enemy. A technique that may be used is to fire the registration adjustment over an extended period of time or registration of the weapons should be conducted in such a manner as to simulate normal harassing and interdicting (H&I) fires.

d. Control Measures. The degree of visibility determines the measures to be taken to insure control. When visibility is poor, the limited ability to control maneuver normally requires the company to move generally in a straight line over open terrain toward its objective. Control measures which are emphasized in a night attack are—

(1) *Assembly area.* The assembly area is normally assigned by the battalion commander. It may be closer to the LD than for a daylight attack.

(2) *Release point(s) (RP).* An RP is a point(s) at which a higher commander releases control of a unit to its commander. The battalion commander designates the company RP, the company commander designates the platoon RP, and the platoon leader designates the squad RP. Platoon and squad RP are located to provide a gradual deployment during movement to the PLD. They should be located far enough back to allow attacking units to complete their lateral movement before reaching the PLD, yet far enough forward to permit centralized control as long as possible.

(3) *Attack position.* An attack position is normally designated as a control measure. The attack position should be in defilade but need not offer as much concealment as in daylight; it should permit easy entrance and exit. The company occupies the attack position only for the minimum time required to receive final instructions, insure coordination, and/or pick up special equipment.

(4) *Point(s) and line of departure.* The company commander normally selects a specific point(s) of departure, where the company will cross the LD.

(5) *Routes.* The company commander selects the route to be used from the company RP to the platoon RP, the platoon leader selects the route from the platoon RP to the squad RP. Normally, selection in both cases is made on the basis of observation of the area from a position to the rear of the LD. The route from the platoon RP to the squad RP is usually announced as a direction. The routes from the squad RP to the PLD are also announced as directions for squad movement. Guides are normally used to assist in the movement to the PLD.

(6) *Probable line of deployment (PLD).* The PLD, normally selected by the battalion commander, is the location on the ground where the company commander plans to complete final deployment prior to moving out with platoons on line. The PLD should coincide with some terrain feature(s) visible at night. It is generally perpendicular to the direction of the attack and as close to known enemy positions on the objective as it is estimated the company can move without being detected. If the enemy has obstacles in front of his position, the PLD should be on the enemy side of the obstacle. The company commander selects the PLD if the battalion commander does not do so.

(7) *Zones of action and objectives.* The company is normally assigned a zone of action and, in addition, may be assigned a direction or azimuth of attack. The company objective for a night attack is usually smaller than for a daylight attack so that the company can clear it in a single assault. The company commander usually assigns platoon zones of action by designating a portion of the PLD and an objective for each platoon. Platoon objectives should also be small enough to be seized and cleared in a single assault. Assigned objectives should be designated by unmistakable terrain features. Intermediate objectives are not normally assigned for night attacks.

(8) *Limit of advance (LA).* An LA is a terrain feature easily recognized in the dark (a stream, road, edge of woods, etc.) beyond which attacking elements will not advance. It is far enough beyond the objective to allow security elements room to operate. The LA may be prescribed by the battalion or company commander.

(9) *Other control measures.* Additional measures which are used to facilitate control in a night attack include—

(*a*) Use of an azimuth, mortar or artillery marking rounds, or tracers to assist in maintaining direction.

(*b*) Use of guides and connecting files.

(*c*) Designation of a base element on which other units base their movement.

(*d*) Use of radar, night vision devices, binoculars, and flashlights with colored filters.

(*e*) Prescribing intervals and distances to be maintained between individuals, squads, and platoons.

(*f*) Identification of leaders and friendly troops by use of luminous buttons or tape, white armbands, etc.

(*g*) Use of radio. This means of control is normally restricted until after the attack is discovered. The company commander may use wire and/or messengers for communication with his platoon leaders.

(*h*) Pyrotechnics may be used as emergency control signals, but their indiscriminate use may alert the enemy.

e. Illumination. The battalion commander, based on the battalion night attack plan, NVP, and illumination availability, determines the degree of artificial illumination to be provided. Even though the attack is to be nonilluminated, plans are made for the use of available illumination in case it is needed. Battlefield illumination should be planned and provided on schedule or on call. (See also STANAG 2088, Battlefield Illumination).

(1) During a nonilluminated attack, no illumination is employed during the advance to the PLD. During the assault, direct illumination by searchlights and flares may be used to blind and confuse the enemy. Illumination used to aid in consolidation after seizure of the objective is normally limited to indirect illumination by searchlights. Direct illumination can be effectively used to detect and assist in repelling a counterattack.

(2) When illumination is used, the attacker may sacrifice secrecy. Skillful use of illumination over a reasonable period of time may assist in deceiving the enemy as to the exact location of the real attack. Illumination may be extended for a considerable distance on both flanks so as not to disclose the exact area of the attack. Illumination may also be used during all phases of the attack or only during the final assault. Phases of night attacks with illumination are conducted basically in the same manner as daylight attacks. However, even with illumination, the problem of control and coordination at night is greater, dispersion is less, and movement is slower than for a daylight attack.

(3) Infrared illumination, in conjunction with appropriate viewing devices, may be used to facilitate movement, control, and firing of weapons.

f. Fire Support. If the attack is to be nonilluminated, some fires may be delivered to maintain the pattern existing prior to the attack. The supporting fires are planned in detail and weapons are positioned and registered, but they are normally delivered only on call under conditions specified by the battalion commander. Fires are planned on the objective to support the attack if it is prematurely discovered, to protect the flanks, and to isolate the objective during the assault and consolidation. The pattern of fire may be used to mask sounds of the attacking elements. Techniques of fire support during periods of reduced visibility are discussed in paragraphs 4–9 through 4–16.

g. Use of Organic and Attached Elements. Organic and attached elements are employed as discussed in (1) through (5) below.

(1) *Mortars.* The mortar is normally employed in general support for ease of control and flexibility. The mortars are positioned, registered, and adjusted on the desired target area by daylight. If the objective is within effective range, the mortars may be left in initial firing positions to capitalize on the registered data until daylight or until continuation of the attack necessitates displacement.

(2) *Antitank section.* The antitank section is usually employed in general support. If secrecy can be maintained, the section may move to firing positions at dusk and prepare to deliver fires on call. If this action is likely to alert the enemy, the section does not support the attack but is kept in defilade behind the LD ready to move to the objective as soon as it is seized.

(3) *Tanks.* In a nonilluminated attack, tanks normally stay behind the LD ready to move to the objective as soon as it is seized. They may be moved into firing positions and laid on targets at dusk, if such action will not alert the enemy. When tanks with searchlights or night vision devices are attached to the company, they may be used as a maneuver element as in a daylight attack or illumination can be furnished by tank-mounted searchlights (10).

(4) *Flamethrowers.* In addition to portable flamethrowers which are organic to the company, mechanized flamethrowers may be provided to the company. They are generally further assigned to rifle platoons and are fired only after the assault has been launched. Flame weapons have a psychological as well as a destructive effect on the enemy. When stealth is mandatory, only portable flamethrowers can be used initially.

(5) *Ground surveillance radars.* The short range radar teams of the battalion ground surveillance section may be employed to monitor the movement of the company forward and help maintain direction. Location and identification of company elements may be aided by use of makeshift reflectors designed to enhance the radar return. Reports are made over wire to the company commander as to the correctness of his direction, changes in enemy activity, and the relative locations of his attacking platoons to each other. Prearranged code messages may be exchanged by manipulation (e.g., blinking) of the radars where company elements are equipped with radar detectors, and by manipulation of radar reflectors by company elements.

7–13. Scheme of Maneuver

Although the plans for a night attack should be complete and detailed, the scheme of maneuver should be as simple as possible.

a. Formations. To assist in control, the column formation is used as far forward as

practicable. If possible, deployment of the rifle squads into a squad line is delayed until the company is within assaulting distance of the enemy positions. The principal considerations in the selection of a formation are visibility, distance to the objective, and anticipated enemy reaction. Based on these considerations, the company normally crosses the LD either in a column of platoon columns or in a line of platoon columns. Generally, the single file formation is avoided.

(1) If visibility is poor, distance to the objective is great, or early contact with the enemy is not expected, the company may cross the LD in a column (fig. 7–2) using one point of departure. This formation is retained until the platoon RP is reached, unless enemy action forces earlier deployment.

(2) If visibility permits control of a more open formation, or the distance to the objective is short, or early contact with the enemy is expected, it may be desirable to advance from the LD in a company line of platoon columns (fig. 7–3) using three points of departure.

(3) If the company is in contact with the enemy and the distance to the objective is short, the leading squads move forward from their positions in squad line. In this case, the LC is, in effect, the PLD.

b. Distribution of Forces. The company commander normally employs all three rifle platoons in the assault. Under conditions of reduced visibility, the effective use of a reserve as a maneuver element is extremely difficult because of the problems involved in control and coordination.

(1) A reserve is withheld only when the company zone of action is extremely narrow or when there is a dangerously exposed flank or rear. If a reserve is designated to provide flank or rear security, the company commander may direct it to follow the attacking echelon closely, or he may leave it on the LD and have it brought forward on signal.

(2) In allocating resources for the night attack the company commander makes provisions for preparation, employment, distribution, and maintenance of night vision devices and surveillance equipment as discussed in paragraph 7–7.

c. Time of Attack. Often an attack is made prior to before morning nautical twilight (BMNT) so that initial objectives can be seized by daylight and the attack continued at that time. If the objective is relatively deep, or if the company mission requires immediate continuation of the attack, the attack may begin early at night and continue to the final objective during darkness. If the objective is to be seized and held, it also may begin early at night.

d. Patrolling. Patrols are normally sent out before a night attack to reconnoiter the routes forward, to secure the RP's and to gather knowledge of the terrain and information of the enemy. In addition, a selected patrol (five to seven men) is generally sent from each platoon. The platoon leader briefs the patrol leader on the location of the squad RP on the route forward from the platoon RP to the squad RP, and the platoon position on the PLD. The platoon leader may give specific instructions on the positioning of patrol personnel on the PLD so these personnel can aid the platoon in deploying. Platoon patrol leaders are briefed by the company commander on the route forward to the platoon RP, on terrain and enemy information desired, on locations of all platoon positions on the PLD, on actions to be taken in the event the enemy is encountered before reaching the PLD, on the guide system he desires, and on anything else that will assist in the accomplishment of their mission. The platoon patrols are normally consolidated into a single company patrol with the company commander designating one patrol leader to coordinate the efforts of the platoon elements. The company commander may direct patrol leaders to leave some members of their patrols to secure the PLD while the remainder return to act as guides. The designated company patrol leader normally remains at the platoon RP where he can best control the platoon patrols and coordinate the guide effort. Designated platoon patrol members (guides) meet their platoons at each platoon RP and guide them to the squad RP and then to the PLD.

e. Security. Frontal and flank security is provided during the movement from the LD

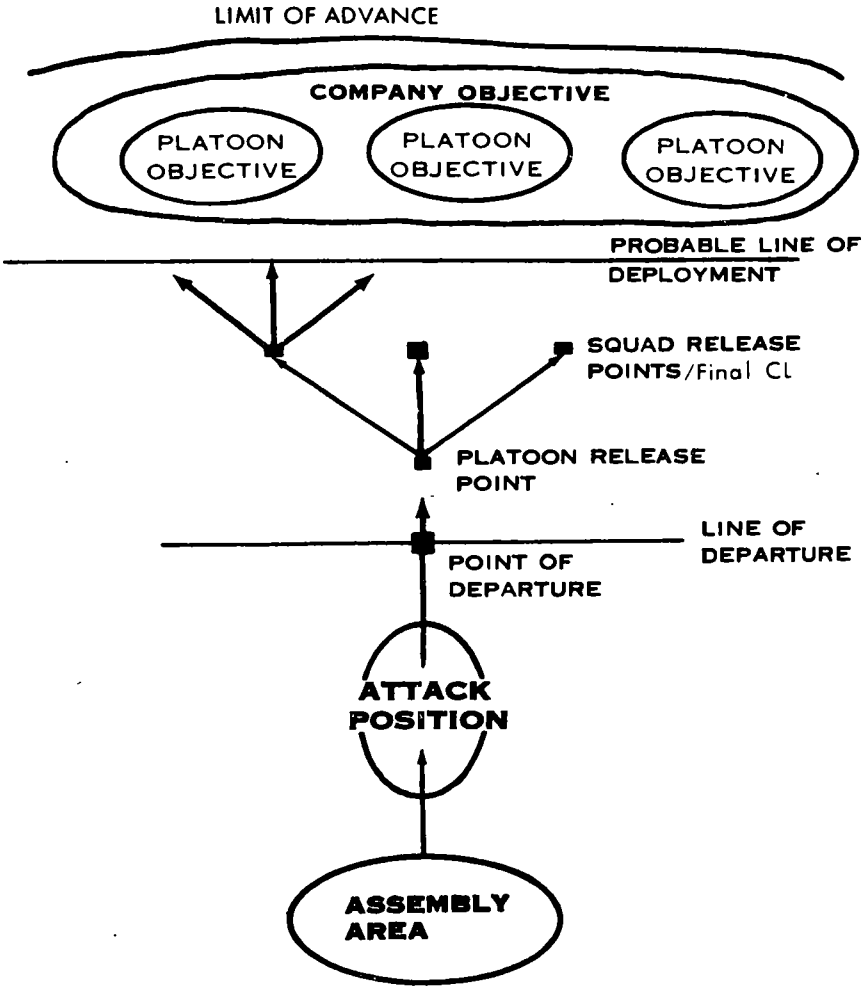


Figure 7–2. Night attack: company column of platoon columns (schematic).

to the PLD. The size of these security elements varies with the amount of detailed information available on the enemy, the terrain, and likely enemy counteraction. The distance at which these security elements operate depends primarily on the commander's ability to control them.

7–14. Conduct of the Attack

The company commander normally leads the company to the platoon RP. Usually, other leaders march near the heads of their units to facilitate control. Once the company crosses the LD, movement is continuous, and the rate of advance is slow enough to permit silent movement. Enemy encountered from the LD to the PLD are bypassed or eliminated as silently as possible. The use of night vision devices such as the starlight scope and the night observation devices are particularly effective during this phase.

a. When attacking initially without supporting fires, the company commander calls for those fires at any time during the movement forward when it becomes evident that the attack has been discovered. When discovered, the company deploys at once from the column formation, continues rapidly to the PLD, and deploys on line; fires are shifted, and the company launches the assault as in a daylight attack. If the company is reasonably close to

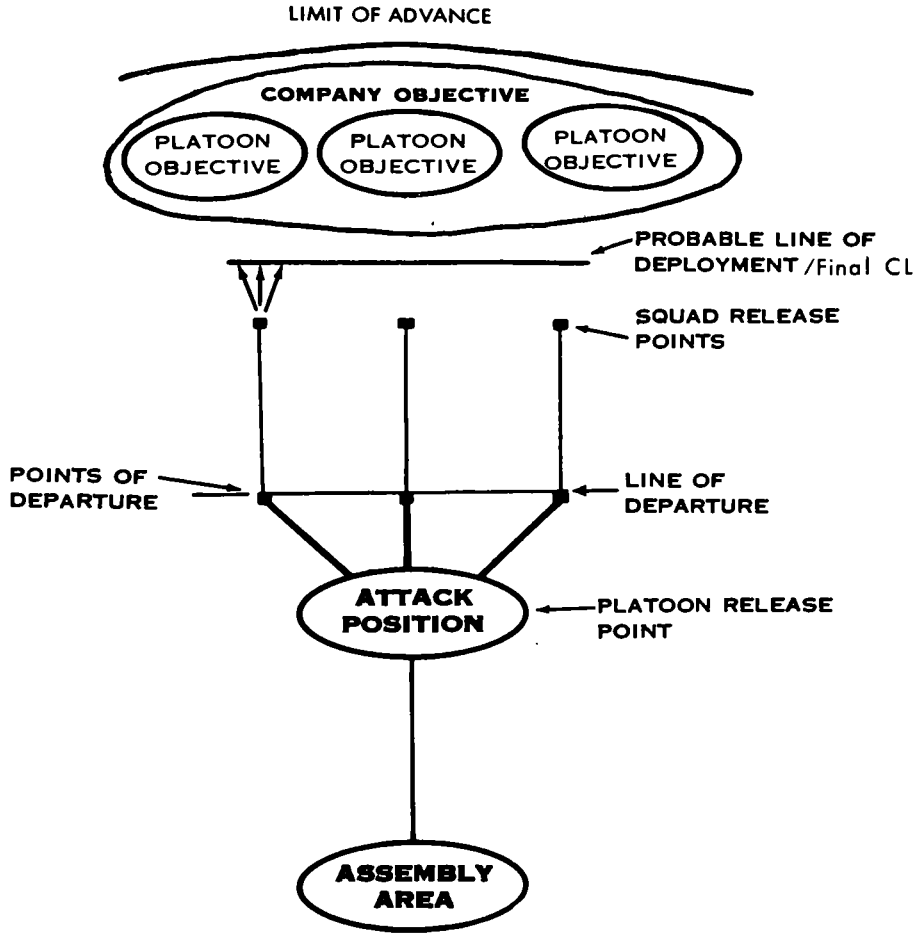


Figure 7–3. Night attack: company line of platoon columns (schematic).

the PLD when the attack is discovered, it should deploy rapidly and launch the assault without hesitation. Illumination may be requested to assist in control or as a countermeasure to blind the enemy.

b. If flares are fired during the movement forward to the PLD, all individuals quickly assume the prone position and attempt to maintain night vision until the flares burn out. The time for firing friendly flares must be coordinated to insure that the company is not prematurely exposed.

c. Normally, platoon leaders report to the company commander when their platoons are in position and ready to continue the movement forward. The company commander directs the movement to continue according to orders from the battalion commander. He may do this by using wire communication or by any other means consistent with security. The company continues the advance by moving forward silently in line without firing.

d. If the attack is discovered during this movement, the assault is begun. The authority to begin the assault is normally delegated down to and including platoon sergeants. Under certain circumstances, it may be delegated to rifle squad leaders. Scattered fire by small elements of the enemy must not be misconstrued as loss of surprise and are not the signal to start the assault.

e. The importance of developing a great volume of fire during the assault cannot be overemphasized; it is at this time that fire

superiority must be established. The assault is conducted aggressively; individuals are encouraged to shout and create as much noise as possible. Riflemen fire from the underarm position. Tracers may be used to increase the accuracy of fire and demoralize the enemy. The company commander may at this time call for supporting fires to isolate the objective, and for direct illumination. The assault should be carried to the military crest (or the LA) on the far side of the objective.

f. Once the objective has been seized, platoons move to their designated areas and consolidate. Squad and platoon leaders establish their flanks on previously indicated terrain features and gain contact with adjacent units. Local security, alert for a possible counterattack, is established. Ammunition is redistributed, supplies are brought forward, key members of the company who have become casualties are replaced, the company command post is displaced, casualties are evacuated, and status reports are made to the next higher headquarters. The company commander checks his supporting fires to determine if they cover the approaches most dangerous to the company. Organic and attached weapons are displaced forward and guided into position. An organized clearing of the enemy in an overrun area is normally conducted after daylight. However, this does not prevent taking action against enemy elements that interfere with the consolidation and reorganization effort.

g. If the attack is to be continued beyond the initial objective, it is usually done at daylight.

h. If a mounted attack is conducted, control measures are similar to those for a dismounted attack, but the mounted attack is executed with maximum speed (ch 10). Artillery may be effectively used, firing on the objective and serving as reference points.

7–15. Actions on the Objective

The plan for consolidation and reorganization following seizure of the objective in a night attack is generally the same as for a daylight attack. The LA prescribed by the battalion commander restricts the area in which elements of the company can be positioned. Because of reduced visibility, areas where platoons consolidate should be delineated by easily recognized terrain features. To facilitate the positioning of supporting weapons and tanks, plans are made for guides to meet these elements at specified points to lead them to their position areas. Special measures may be required to permit rapid resupply of ammunition, evacuation of casualties, and other actions during the reorganization. The flamethrower servicing and charging point is set up as close by as the tactical situation permits. If the mechanized infantry rifle company attacks dismounted, its personnel carriers will join it after the objective is secured.

Section IV. INFANTRY RIFLE PLATOON

7–16. Basic Considerations

The considerations for a rifle platoon conducting the night attack are the same as the rifle company (para 7–10 through 7–15).

7–17. Planning and Preparation

a. General. The difficulties of a night attack are overcome by thorough planning, preparation, and training in night operations. Normally, more time is required to plan and coordinate a night attack than a daylight attack.

(1) Upon receipt of the warning order for a night attack, the rifle platoon leader begins his planning and preparation.

(2) After receiving the company attack order, the platoon leader formulates his plan of attack to include—

(*a*) Reconnaissance by key leaders.

(*b*) Selecting, briefing, and dispatching security patrols.

(*c*) Control measures and formations to be used from the assembly area to the objective.

(*d*) Actions at the PLD.

(*e*) Actions when the attack is discovered.

(*f*) Conduct of the assault onto the objective.

(*g*) Consolidation and reorganization on the objective.

(*h*) Use of organic and supporting fires.

(*i*) Employment of night vision devices.

(3) The platoon leader issues his order in the standard format. Although a plan of attack should be as simple as possible, a night attack order is normally lengthy and detailed because of the additional control measures and special instructions required. In conjunction with the order, a thorough terrain orientation is necessary.

(4) Preparation for the night attack is generally the same as for the daylight attack, as discussed in FM 7–15. Special emphasis is placed on—

(*a*) Rehearsals during both daylight and darkness. Rehearsals should include, but not be limited to—formations; audible and visual signals; use of night vision devices; and the actions of the platoon from the assembly area to the objective.

(*b*) Members of the platoon resting prior to the attack.

(*c*) Carrying only equipment essential for the success of the attack. All other equipment should be left behind and arrangements made for its delivery on the objective.

(*d*) Camouflaging individuals and equipment. Equipment which rattles is padded or tied down.

(*e*) Avoiding test firing of weapons and unnecessary movement which would prematurely disclose the forthcoming attack.

(*f*) Insuring that the night vision of the platoon members is not destroyed by the use of lights prior to the attack and insuring readiness of organic night vision aids.

(*g*) Preparing luminous or other special markings for identification of individuals.

b. Reconnaissance. The platoon leader and his squad leaders, if possible, conduct a reconnaissance during daylight, dusk, and dark. Reconnaissance during changing conditions of light assures maximum familiarity with the terrain as it appears during the conduct of the attack. The reconnaissance is facilitated by the use of starlight scopes. To insure secrecy, the company commander normally limits the size and activities of the reconnaissance parties.

c. Surprise and Secrecy. Surprise and secrecy considerations for the platoon are the same as those previously discussed and prescribed for the company.

d. Control Measures. Control measures previously discussed and prescribed for the company also apply to the platoon.

e. Organic and Attached Weapons. In a night attack, the weapons squad can be employed by the platoon leader in several ways.

(1) Crew served weapons of the weapons squad (particularly machineguns) may be attached to the rifle squads and participate in the assault. In this case, the weapons are normally attached to the rifle squads in whose area they are to be employed in the consolidation. This employment technique is the most desirable since the volume of fire provided by the machineguns adds to the platoon's combat power during the assault.

(2) Crew served weapons teams may follow the rifle squads at a specified distance. Again, the weapons are normally attached to the rifle squads in whose area they are to be employed in the consolidation. If necessary, the platoon leader can direct any or all of the crew served weapons teams to accomplish a particular mission during the movement forward from the squad release points.

(3) The weapons squad may remain intact in column formation and follow assaulting elements at a specified distance. During, or just as the consolidation phase begins, the weapons teams move to their designated locations for the consolidation and cover of the probable avenues of enemy approach. This is normally the least desirable course of action because the crew served weapons provide no support for the attacking rifle squads.

(4) Machineguns may be positioned on terrain to the rear that affords maximum overhead fire on the enemy. This technique is most advantageous when the attack is likely

to be discovered prematurely and close fire support is necessary. Particular attention must be placed on the use of signals for commencing, shifting, or lifting machinegun fires.

(5) A combination of any of the above techniques may be used for employment of the weapons squad.

(6) Portable flamethrowers may be attached to the platoon for a night attack, and napalm field expedients may also be employed. Flame has a great psychological effect at night and assists the attacker during the assault by providing some illumination. Flamethrowers are fired only after the assault has been launched.

f. Communication. The means of communication employed with the rifle platoon in the night attack are wire, radio, visual signals (metascope, starlight scope, flashlight, and pyrotechnics), personal contact, and messenger. Wire may be laid between the company commander and platoon leader. The use of radios is normally restricted until the attack is discovered. Prearranged code messages may be exchanged with supporting radars by manipulations, such as blinking of radars (where the platoon is equipped with radar detection devices) and by manipulation of makeshift radar reflectors.

7–18. Scheme of Maneuver

The rifle platoon normally participates in the night attack as part of a rifle company. The scheme of maneuver of the platoon is that of the company.

a. Formation. To assist in control of the platoon, the column formation is used as far forward as practicable. If possible, deployment of the rifle squads into a squad line is delayed until the company is within assaulting distance of the enemy positions. The principal considerations in the selection of a formation are visibility, distance to the objective, and anticipated enemy reaction. Based upon these considerations, the company normally crosses the LD either in a column of platoon columns (fig. 7–2) or in a line of platoon columns (fig. 7–3). Generally, the single-file formation is avoided.

(1) If visibility is poor, distance to the objective is great, or early contact with the enemy is not expected, the company may cross the LD in a column. Unless enemy action forces earlier deployment, the column formation is retained until the advancing troops reach the platoon release points.

(2) If visibility permits control of a more open formation, the distance to the objective is short, or early contact with the enemy is expected, it may be desirable to advance from the LD in a company line of platoon columns.

(3) If the company is in contact with the enemy and the distance to the objective is short, the leading squads move forward from their positions in a squad line. In this case, the LD is, in effect, the PLD.

b. Platoon Formations. The platoon column formation is used from the assembly area to the squad RP, unless earlier deployment is forced by enemy action. The platoon line formation is used from the PLD forward.

c. Squad Formation. The squad column is normally used until the platoon deploys into the line formation. The file formation is avoided unless extremely limited visibility makes control of the squad column impossible or unless terrain restrictions prohibit the use of the column. Use of the file formation by squads doubles the length of the platoon column and consequently increases the time necessary to complete deployment into the line formation.

d. Positions of Leaders. When in the column formation, leaders normally march near the front of their column to facilitate control. When in the line formation, they position themselves to best control their units. Their position varies with terrain and light conditions.

e. Distribution of Forces. To achieve maximum firepower, the rifle platoon leader employs all three rifle squads on line in the night attack. Though the platoon does not constitute a reserve in the night attack, it may be assigned the mission as the reserve force of the rifle company as discussed in paragraph 7–13.

f. Time. Considerations of the time of at-

tack are similar to those of the company (para 7–13*c*).

g. Security Patrols. Prior to a night attack, and during darkness, a patrol of five to seven men is normally sent out by each rifle platoon. The mission of this patrol is to provide reconnaissance and security of the platoon route, squad RP, and the platoon portion of the PLD. When the area is reconnoitered and secured, at least two guides return to the platoon RP to guide the platoon to the PLD. The guides report information of any danger areas discovered to the platoon leader.

(1) The platoon leader issues the patrol order to the patrol leader. This order normally includes—

(*a*) Route from the platoon RP to the PLD, including the locations of the squad RP.

(*b*) Specific instructions on the positioning of patrol personnel on the PLD to best aid the platoon in deploying thereon.

(*c*) Employment of guides.

(2) The platoon leader should provide the patrol leader with a minimum of one starlight scope to assist him in making a night reconnaissance of the operations area and to keep danger areas under observation.

(3) The patrol leaders are also briefed by the company commander. He orients them on the route forward to the platoon RP, on the time for elimination of any enemy security posts encountered between the squad RP and the PLD, the time and place where returning patrol members (guides) must report, and other information deemed necessary for the accomplishment of the mission.

(4) After dark, the patrols of the company under the control of the senior patrol leader move forward to a point near the LD (usually the attack position). From this point, the individual platoon patrols move forward and secure the PLD. Two or three members of the patrol return to the platoon RP to guide the platoon to the squad RP and to the PLD. The remaining members of the patrol under the command of the patrol leader stay on the PLD and assist in positioning the squads when they arrive with the guides.

(5) Enemy outposts on or near the PLD are kept under surveillance and eliminated at the time designated by the company commander or just prior to the arrival of the platoons on the platoon RP. Enemy encountered from the LD to the squad RP are bypassed, if possible, or eliminated as silently as possible. The secrecy of the attack may be jeopardized by the premature elimination of the enemy security post.

(6) In addition to security patrols on the PLD, the platoon uses local frontal and flank security in moving from the platoon RP to the squad RP. The size of the security elements varies with the amount of detailed information available concerning the terrain, and the enemy and his likely counteraction. The distance at which they operate depends primarily on the platoon leader's ability to control them.

(7) The patrol leader should carry a radio to keep the platoon leader informed on any unforeseen enemy situation that may compromise the overall attack. Authority and circumstances permitting the patrol to break listening silence must be clearly defined by the company commander in his briefing to the patrol leaders.

7–19. Conduct of the Night Attack

a. Security patrols depart the company assembly area in time to accomplish their mission prior to the arrival of the platoons at the PLD. If enemy listening posts are encountered between the LD and the squad RP, they should be bypassed or eliminated silently. If bypassed, their location should be reported to the company commander and platoon leader. If the listening posts are encountered between the squad RP and the PLD, the patrols wait until the time designated by the company commander and then eliminate them as silently as possible and continue forward to secure the PLD. In the event the security patrols are discovered, they either destroy the listening posts or withdraw, according to the directions that have been issued by the company commander.

b. With the use of night vision devices, the rifle platoons normally move in a company column formation from the assembly area to the platoon RP. At the platoon RP, they meet their guides from the security patrol and con-

tinue to move along their respective routes to their squad RP. The platoon communication wire is connected to the company switchboard prior to crossing the LD. Frontal and flank security is used, as appropriate, from the platoon RP to the squad RP.

c. Once the platoon crosses the LD, movement to the PLD is continuous. The rate of advance is slow enough to permit silent movement. Enemy encountered are eliminated as silently as possible.

d. If overhead flares are fired during the movement forward to the PLD, troops quickly assume the prone position until the flares burn out. If caught in the light of a ground flare, individuals move out of the lighted area as rapidly and quietly as possible. Close coordination is required on the use of friendly flares because indiscriminate use of them will result in loss of surprise. If the attack is to be illuminated, friendly flares are fired on signal from the attacking elements (usually after the attacking elements reach the PLD).

e. On arrival at the squad RP, rifle squads are released from the platoon column formation to deploy on line prior to reaching the PLD. Members of the security patrols assist the squad leaders in positioning the squads on the PLD.

f. When the platoon is fully deployed, the platoon leader reports to the company commander by wire, radio, or messenger. On order from the company commander, the platoon moves forward silently from the PLD, maintaining the platoon line formation and guiding on the base platoon. The squads guide on the base squad using starlight scopes to assist them.

g. When the attack is discovered, the assault is initiated. The authority to initiate the assault is normally delegated down to and including platoon sergeants, and under exceptional conditions down to and including squad leaders. Scattered fire by small elements of enemy must not be taken as loss of surprise and is not the signal to start the assault.

h. The importance of developing a great volume of fire during the assault cannot be overemphasized. It is at this time that fire superiority must be established and maintained. The assault is conducted aggressively. Troops shout and create as much noise as possible to confuse the enemy. Tracer fire is used to increase accuracy and control of fire and to demoralize the enemy. Planned indirect fires are requested to isolate the objective. The assault is conducted in the same manner as discussed for daylight in FM 7–15 and continues to the far side of the objective. The platoon must not move any farther than the LA.

i. When the objective has been seized, the rifle platoons consolidate. Squad and platoon leaders establish their flanks on previously designated terrain features and establish contact with adjacent units. Organic and attached weapons teams move rapidly into predesignated positions. Local security does not go beyond the LD. Ammunition is redistributed, supplies are brought forward, key members of the platoon who have become casualties are replaced, casualties are evacuated, and status reports are made by all leaders. Artillery and mortar FO's continue to request and adjust indirect fire on the enemy and along probable avenues of approach.

j. The conduct of the attack, as described above, requires that the attacking elements reach the PLD without being discovered. If the attack is discovered prior to reaching the PLD, the following actions normally occur:

(1) The company commander calls for planned supporting fires on the objective to neutralize the enemy fires. Planned illumination is called for in accordance with the NVP to permit better control and more rapid movement. If the platoons have not yet been released from the company column formation, the company commander releases them at this time and has them continue rapidly to the PLD.

(2) The platoons should attempt to continue in the column formation to the PLD, deploy on the line as they arrive, and continue as in a daylight attack, treating the PLD as a tentative final coordination line. If they are unable to advance in the column formation without accepting excessive casualties, they must deploy and use fire and movement to

reach a position (preferably the PLD) from which the assault can be launched.

(3) As the supporting fires are masked, the company commander shifts them to seal off the objective.

(4) Once the assault is initiated, the attack progresses as described in *h* and *i* above.

CHAPTER 8

AIRBORNE FORCES IN THE NIGHT ATTACK

Section I. AIRBORNE INFANTRY BATTALION

8–1. General

With the use of night operating aids, the tactics and techniques used by airborne forces during night operations differ only slightly from those used during daylight operations. A night airborne operation involves the movement and delivery of combat forces and their logistic support into an objective area. Normally, the ground forces are provided by the Army and the airlift forces by the Air Force. Ground forces participating in night airborne operations are either parachuted or airlanded into the objective area. Complete details on airborne operations are discussed in FM 61–100, FM 7–30, FM 7–20, FM 7–11, and FM 7–15.

8–2. Basic Considerations

a. Employment of the Airborne Infantry Battalion. The employment of the airborne infantry battalion in the night attack is the same as the infantry battalion discussed in chapter 7 with the exception of the landing, assembly, and reorganization which precede the attack.

b. Characteristics of Night Airborne Operations. Airborne operations are planned to achieve tactical surprise and are completed in the shortest practicable time. The rapidity of the attack reduces the vulnerability of the airborne force to enemy counteraction, including the use of enemy nuclear weapons.

(1) Unity of command throughout the operation is essential.

(2) The operation of an airborne infantry battalion differs generally from those of other ground forces in that—

(*a*) It has limited artillery, heavy equipment, and armor support in the initial objective area.

(*b*) It must be prepared to fight in all directions.

(*c*) It may be required to initially secure a drop or landing zone for the delivery of additional forces.

(*d*) Adverse weather (primarily low visibility and high winds) may restrict the conduct of airborne operations.

(*e*) Reduced visibility makes assembly of tactical units difficult and time consuming.

(*f*) Airborne forces are particularly vulnerable to enemy armor, air, and other fires during flight, landing, and assembly.

(*g*) An airborne assault usually is made in lightly defended areas, facilitating initial tactical surprise.

(*h*) Obstacles and enemy defenses that would ordinarily have to be overcome or reduced by ground attack may be bypassed by vertical envelopment.

8–3. Planning and Preparation

a. Since the time available for preparing for a night airborne operation may be limited, units must maintain maximum readiness to take part in an airborne assault on short notice. Night operations of airborne battalions may be launched within 24 hours or less after receipt of the order, provided the unit is fully trained and prepared to perform such operations. Type aircraft loading plans are prepared to enable the battalion to adapt readily to various types and numbers of aircraft or methods of employment. A unit SOP will reduce the preparation time required. Additionally—

(1) When operating independently, the battalion is involved in planning to a greater degree than when operating as a part of a brigade.

(2) Plans for an airborne operation must be simple and flexible. All leaders must be prepared to overcome unforeseen difficulties and exploit opportunities that may arise during the conduct of the operation. To attain flexibility, the planner—

(*a*) Insures that the success of the operation does not depend on the arrival of any one aircraft flight, serial, or tactical unit.

(*b*) Develops a simple landing and assembly SOP.

(*c*) Uses landmarks that are easy to locate and identify at night from the air.

(*d*) Prepares alternate plans to allow for adverse weather conditions, inaccurate delivery of units, communications failures, and similar contingencies.

(*e*) Makes allowances for operational delays in takeoffs and landings.

(*f*) Maintains tactical integrity of units in loading plans whenever possible.

(*g*) Prepares a simple plan for the disposition of troops and equipment at departure areas.

(*h*) Incorporates consideration of phase back in planning in the event of a shortage of aircraft or sudden insertion of a high-priority unit into the air movement plan.

(*i*) Makes maximum use of the night operating aids in conducting reconnaissance and surveillance of the operational area.

(*j*) Formulates techniques and plans for employment of aids to increase night visibility of the tactical force during the landing, assembly, night attack, and security of the objective area. This information is placed in the night visibility plan (NVP).

b. Additional details concerning the planning for the airborne battalion in a night airborne operation are discussed in FM 61–100 and FM 7–20.

8–4. Scheme of Maneuver

The ground tactical plan includes the assault plan and plans for subsequent operations such as defense, linkup, withdrawal, continued offensive operations, and displacement as appropriate. Night assault and defense plans are prepared concurrently and include a scheme of maneuver, fire support plan, and NVP. Alternate plans are also prepared. The development of the ground tactical plan for execution after delivery of airborne forces in the objective area is discussed in FM 7–20 and in chapter 7.

8–5. Conduct of the Night Airborne Landing, Assembly, and Reorganization

The landing, assembly, and reorganization periods for the airborne night attack are the most critical periods for the battalion. With the use of night operating aids, the increased night observation and surveillance capabilities facilitate speed and precision in assembly and reorganization. When necessary, security is sacrificed for rapidity in gaining control and accomplishing unit reorganization. Passive night vision devices are employed to the maximum practicable to achieve assembly and reorganization.

a. Landing. Battalion elements are landed on or as close to their objectives as possible. Normally, some time is required for these elements to collect their equipment and assemble as tactical units. When possible, this should be accomplished before engaging in combat. Surprise is enhanced by the use of night vision devices, landing on the objective, or making the move to the objective as short and as rapid as possible. The aircraft flight serials are organized to facilitate execution of the ground tactical plan.

b. Assembly and Reorganization. The battalion reorganizes according to a prearranged plan, using designated night assembly areas and night operating aids with emphasis on the identification markings for personnel and equipment. Assembly is critical and is accomplished most rapidly and efficiently with the use of night vision devices.

(1) Security elements assemble and move to their positions. Main force elements move quickly to their assembly areas, carrying the equipment and supplies required for the mission. Mortar, artillery, and other units occupy their initial firing positions and prepare to support the assembly and reorganization. Movement, security, and orientation of ele-

ments is facilitated by use of night vision devices.

(2) Radio nets are opened on landing. Company and attached unit commanders report the status of personnel and equipment as prescribed in the battalion SOP. The battalion reorganization is complete when all units are assembled and accounted for, and battalion has established control.

(3) Troops that land outside the planned objective area assemble rapidly under the senior leader present. He establishes contact with the closest available headquarters and returns personnel to their respective units as soon as possible. Lacking other orders, such groups direct their efforts toward accomplishing the overall mission. Individual stragglers join the nearest unit and rejoin their own units as soon as the situation permits. Procedures described for the assembly of personnel dispersed by the parachute delivery are more rapidly and efficiently accomplished when using available night vision devices, such as the metascope and electronic binoculars for signalling in accordance with the NVP.

Section II. AIRBORNE INFANTRY COMPANY AND PLATOON

8–6. Airborne Infantry Company

a. The airborne infantry company is capable of conducting night attacks as a separate unit, but is more effective and is normally employed as part of the airborne infantry battalion. Once on the ground the units fight as regular infantry as discussed in chapter 7.

b. The basic tactics, techniques, and planning used for a night airborne operation are essentially the same as for the daylight operation. However, for night airborne operations detailed emphasis and consideration are given to command and control measures, simplified landing and assault plans, and to the employment of fire support and illumination means. Detailed discussions of daylight airborne operations are found in FM 7–20, FM 7–11, and FM 61–100. Details of night attack operations for the company are the same as the airborne infantry battalion.

8–7. Airborne Rifle Platoon

a. In night airborne operations, the rifle platoon normally fights as part of the rifle company. The rifle platoon may be required, however, to fight independently or semi-independently during all or a part of an operation. This may occur as a result of aircraft failure or inaccurate delivery separating the platoon from its parent company.

b. The rifle platoon can land in unprepared, lightly defended terrain that is relatively free of obstacles or where obstacles are hindrances to the selected delivery means. Immediately after assault landing, individuals can fight to protect themselves and elements can fight if they have retained tactical integrity or as they regain it. However, the platoon must assemble as a fighting element under control of the platoon leader before it is capable of effective tactical employment. The time required to regroup following daylight parachute landing operations is normally greater than for an airlanded operation. This differential is even greater in the night parachute landing operation and night vision aids must be employed efficiently to aid in assembly to reduce this problem as much as possible.

c. After a night airborne assault landing, the rifle platoon operates tactically in substantially the same manner as discussed in chapter 7. Details for planning an airborne operation are found in FM 7–20, FM 7–11, FM 7–15 and FM 61–100.

CHAPTER 9

AIRMOBILE INFANTRY FORCES IN THE NIGHT ATTACK

Section I. GENERAL

9-1. General

The overall success of any force may well depend upon its ability to fight at night. Offensive airmobile action at night and under conditions of reduced visibility may often succeed where a daylight operation would be impractical. Darkness increases problems of control, movement, and navigation of ground units as well as aviation units. Night operations may be executed to give the airmobile infantry forces (AMIF) a tactical and psychological advantage over the enemy.

9-2. Methods

a. There are two methods of conducting night airmobile attacks—illuminated and nonilluminated.

(1) *Illuminated attack.* Normally, the AMIF conducts the illuminated night attack; however, the particular method employed depends on consideration of the enemy strength, the degree of preparation of his defensive positions, his security measures, the terrain, light conditions, and illumination means available. The illuminated night attack is made when the enemy position is strong, when the possibility of achieving surprise is remote, when control requires use of daylight control techniques and when terrain and light conditions so dictate. When conducting the illuminated attack, surprise may be gained by withholding illumination until the landing phase.

(2) *Nonilluminated attack.* The nonilluminated night attack is made to achieve surprise and requires the landing zone to be considerably larger, easier to identify, and obscured from the objective. Passive night vision devices and electronic guidance methods in conjunction with a pathfinder unit must be used to achieve success. To achieve secrecy the pathfinder unit may be parachuted into the objective area using the high altitude, low opening technique (HALO). The air landing of a nonilluminated attack is very difficult and requires thorough planning and rehearsal under simulated conditions of the attack.

b. Extensive and thorough air and artillery LZ preparation is inherent in all nonsurprise, illuminated night attacks. Illuminated attacks assist in assuring adequacy and coverage of these preparatory fires. However, when the risk of mined landing zones is acceptable, surprise may be gained by withholding illumination until the landing phase begins.

Section II. AIRMOBILE INFANTRY BATTALION

9-3. General

Though the airmobile infantry battalion (AMIB) is designed specifically to conduct a heliborne (helicopter transported and supported) operation, all types of infantry battalions are capable of participating in night airmobile operations. The mechanized infantry battalion must leave certain items of heavy equipment behind when conducting airmobile operations. Once the AMIB has completed the air movement, landing and seizure of the initial objective (landing zone), night attacks out of the landing zone are conducted essentially as discussed in chapter 7.

9-4. Basic Considerations for Conducting Airmobile Night Attacks

a. When conducting airmobile operations, day and night reconnaissance by the aviation mission commander and the AMIF commander

are desirable. Night reconnaissance is best accomplished using passive night vision devices from aircraft.

b. Pathfinders are used to provide essential services at the loading zone and en route to the landing zone as well as terminal guidance at the landing zone.

c. Loading and landing zones should be larger at night than in daylight to facilitate night operations.

d. Positive, detailed, aircraft control procedures must be used throughout the operation.

e. Weather conditions should permit flying at altitudes that provide positive terrain clearance. Areas heavy with dust must be avoided, when possible.

f. Air and artillery preparation of LZ's should, whenever possible, be fired prior to all attacks not requiring surprise.

9–5. Planning and Preparation

a. General. Successful night airmobile operations may be impromptu; however, the risk of failure is greater than during daylight operations. Whenever feasible, night airmobile attacks should be planned in detail. However, when time does not permit, SOP should be followed. SOP, therefore, should be detailed and thorough. An essential part of the planning is preparation of the night visibility plan (NVP). When practical, a rehearsal of plans is conducted during similar conditions of darkness. For this reason the AMIF must maintain a constant state of readiness, consistent with its other missions, to perform night airmobile operations. By developing SOP (which include loading plans) for night airmobile operations, units may considerably reduce the preparation time required. Field experience and training enhance unit readiness and also reduce the preparation time required. For detailed planning of airmobile operations see FM 57–35.

b. Reconnaissance. For a discussion of reconnaissance in airmobile operations see paragraphs 4–28 through 4–38.

c. Surprise and Security. In the planning and preparation for airmobile operations, measures are taken to prevent the enemy from learning of an impending operation. Planning and preparation, although oriented toward the operation, are characterized by their routine appearance. Efficient and successful conduct of the reconnaissance without alerting the enemy to plans is materially improved by use of passive night vision devices. Normally, night attacks allow the commander to surprise the enemy and avoid heavy losses.

d. Control Measures.

(1) The LZ's are lighted by pathfinders or unit terminal guidance personnel after introduction into the LZ with the initial assault echelon. The normal method is to use field lighting sets or flares dropped by aircraft. It is also possible to land at night using only flashlights, or the helicopter landing light. The security force, once landed, prepares the night LZ for the arrival of the remainder of the battalion. Pathfinders and terminal guidance teams may rely on passive devices to accomplish LZ preparations.

(2) The tactical control measures associated with the ground tactical plan and used by an assaulting AMIB are essentially the same as those discussed for the infantry battalion in chapter 7.

(3) Special control measures include planning for maximum use of the night operating aids to assist in identifying friendly troops, assembly of the ground force, and delivery of effective fire into hostile or suspected areas. These measures are included in the NVP.

e. Illumination. The employment of illumination during an airmobile night attack is essentially the same as for any other type of night attack. Definitive guidance on the control and phasing of illumination in accordance with the NVP must be provided. Target illumination may be provided by airborne searchlights, vehicle mounted searchlights, or illuminating rounds from mortars and artillery, and flares delivered by Air Force and Army aircraft.

f. Fire and Support. Artillery support should be used more extensively at night to compensate for the reduced effectiveness of other fire support means. Fire support elements must rely on prearranged communication and visual signals to identify friendly troop location.

g. Communication. Communication plans are coordinated to include establishment of

nets, exchange of call signs between units, authentication procedures, radio frequencies, and SOI and SSI extracts. Army aircraft are used in a radio relay role as required.

h. Special Planning. Special consideration should be given in planning for combat service support.

(1) Normally, a battalion logistical base is established in a secure area. The initial combat load of supplies is carried into the objective area by the assaulting force with resupply being conducted by helicopters or other type aircraft.

(2) A battalion medical aid station should be designated for location in the objective area with a landing zone suitable for medical evacuation helicopters.

(3) Consideration may be given to the provision of military police elements for the security and air evacuation of prisoners of war (PW) from the objective area to the rear base PW collection point where limited processing may be done.

9–6. Scheme of Maneuver

The scheme of maneuver for night airmobile operations must be simple but complete in detail. Normally, the scheme of maneuver includes a ground tactical plan, landing plan, air movement plan, loading plan, and staging plan. All planning and execution of a night airmobile operation depends on the AMIB commander's ground tactical plan. This plan must be completed before the other plans can be formulated since it serves as the basis for the remaining plans. Each plan supports the succeeding plan. Figure 9–1 illustrates a scheme of manuever, airmobile infantry battalion in the night attack.

a. Ground Tactical Plan. The ground tactical plan includes the assault plan, assembly of forces plan, defense of LZ plan, fire support plan, night visibility plan (NVP), and plans for subsequent operations. Night assault and defense plans are prepared concurrently and include a scheme of maneuver, fire support plan, and NVP. Alternate and contingency plans are also prepared. The development of the ground tactical plan is essentially as discussed in chapter 7 and in FM 7–20. However, additional consideration is given the following:

(1) *Sectors.* Sectors assigned to subordinate units should include adequate landing zones. A company should not be required to fight in divergent directions. Desirably, the boundaries designated apply to the assault and defense phases in the initial objective area (LZ).

(2) *Objectives.* Objectives assigned include those terrain features whose early seizure are required for the defense of the landing zone and subsequent objectives.

(3) *Assembly and reorganization.* In a night airmobile assault, units reorganize in assigned assembly areas and attack immediately to seize assigned objectives. Units may be directed to attack before assembly is complete. In an airmobile operation, assembly time is reduced and reorganization is simplified over that of airborne operations.

(4) *Security forces.* In an airmobile operation, because of the expanded area of responsibility dictated by a perimeter-type defense, it is necessary to economize in the use of security forces. This force is controlled by the battalion commander and makes up the combat outposts.

(5) *Employment of reserves.* The reserve may enter the objective area (LZ) in the assault echelon. It may be assigned security missions to protect supporting elements within the objective area. In the defense of the LZ, the reserve elements of the rifle companies may be designated as the battalion reserve.

b. The Landing Plan, Air Movement Plan, Loading Plan, and Staging Plan. These are the detailed plans necessary to conduct an airmobile operation. For discussion in detail see FM 57–35.

c. Distribution of Forces. The organization for night combat of the AMIB is essentially the same as the infantry battalion discussed in chapter 7.

d. Time. Time patterns are avoided so that the enemy cannot predict the time of attack. An attack may be made late at night so that initial objectives can be organized before daylight and the attack continued at that time. If the objective is relatively deep, or if the

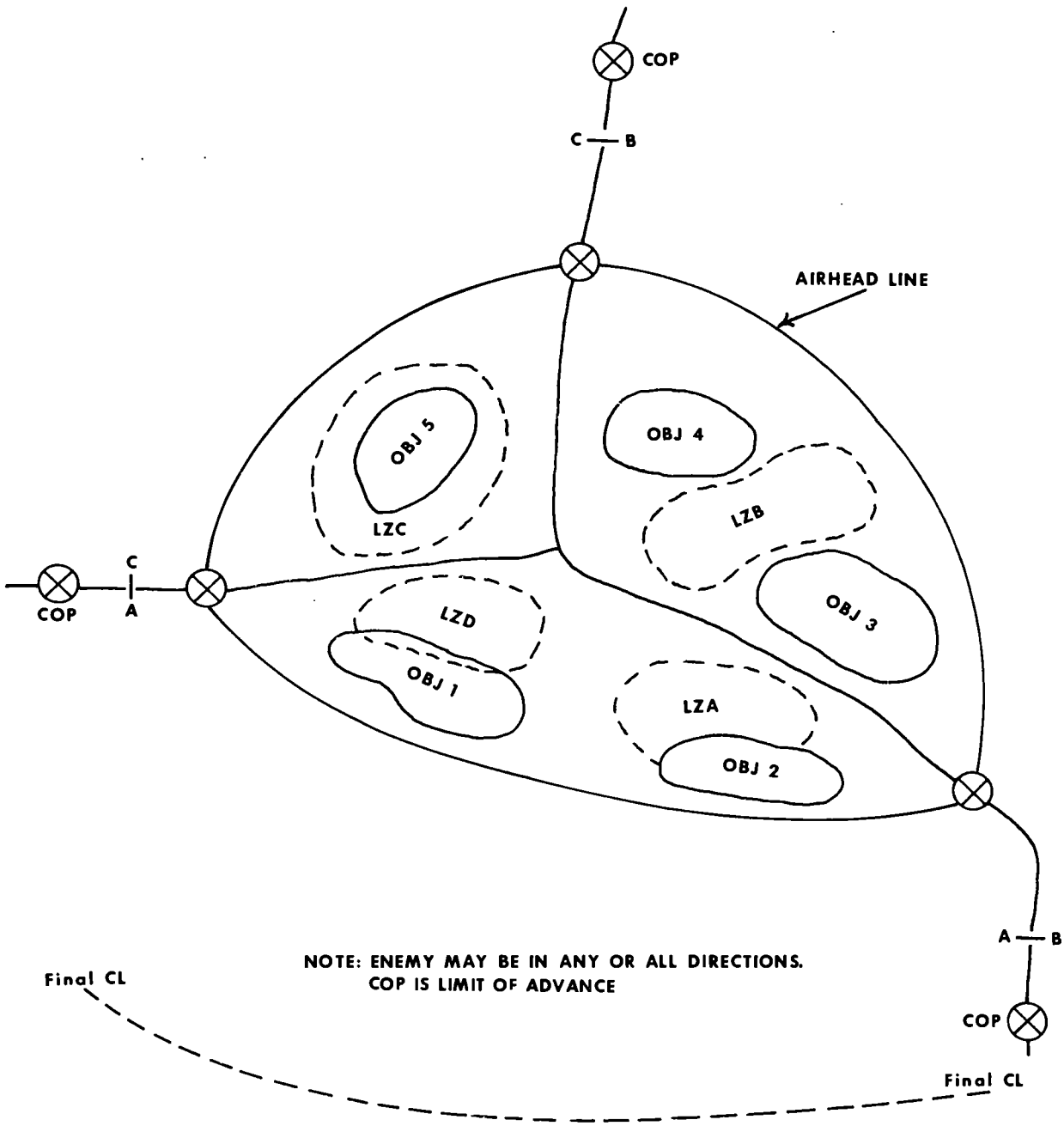


Figure 9–1. Scheme of mancuver, airmobile infantry battalion in the night attack (schematic).

AMIB mission requires immediate continuation of the attack, the attack may begin early at night. If the objective is to be seized and held, the attack may begin early at night with the consolidation of the objective taking place during darkness. Noise and light must be carefully controlled. Deception measures may include feints, illumination demonstrations, and/or artillery fires to cover the noise of aircraft.

9–7. Conduct of the Night Airmobile Attack

a. General. The loading, takeoff, and movement of the airmobile force are controlled by the AMIF commander. The commander of the supporting transport aviation unit advises and assists him by maintaining communication with the aircraft and by transmitting instructions as required. The battalion commander is kept informed of the progress of the loading and of any changes in serial composition, delay, or other problems resulting from aircraft aborting prior to or on takeoff. This is particularly important during shuttle movements.

b. Preparation of the Landing Zone. Air and artillery preparation of landing zones will often begin prior to air movement of assault forces (depending on preparation time and flight time) and continue until immediately before the introduction of the first troops pathfinders or assault).

c. Air Movement. Serials take off from the loading area by flights at the time prescribed. The takeoff and movement to the start points are executed so that the flights arrive at the initial points at the prescribed time and in the proper formation.

(1) The aviation unit commander is responsible for executing the flight as prescribed by the AMIB commander. He keeps the commander informed of progress during the flight and makes any recommendations he considers appropriate. The AMIB commander maintains contact with the column during flight and transmits instructions as required.

(2) Upon reaching the release points, flights within the column formation leave the formation and proceed to the assigned landing areas and/or drop zones. They may be guided either by pathfinders, infiltrating patrols, self-erecting navigation aids, or airborne guides.

(3) After the troops have been airlanded, every effort is made to reduce congestion in the landing areas and minimize the aircraft ground time. Aircraft are unloaded rapidly and take off for return movement by flights without organizing into serials. Return flights must be coordinated with the fire support coordinator and other affected agencies. When returning flight leaders reach a predesignated point, they contact the loading area for instructions.

d. Landing and Reorganization. The landing and reorganization of the initial assault are the most critical periods for the airmobile battalion. During this phase, maximum use should be made of the night vision devices to expedite the assembly and to provide LZ security as early as possible.

(1) Battalion elements are landed on or as close to their objective as possible. Normally, a short time is required for these elements to collect their equipment and assemble as tactical units before engaging in combat. Surprise is enhanced by landing on the objective with the use of passive night vision devices and aerial guidance equipment. Aircraft loading and flight serials are organized to facilitate execution of the ground tactical plan.

(2) The battalion reorganizes according to a prearranged plan, using designated assembly areas.

(3) The use of night operating aids enhance the locating of premarked assembly areas, personnel, and equipment.

(4) Speed and precision are the essential elements in the assembly plan, but normally security comes first.

(5) Radio nets are opened on landing. Mortar, artillery and other supporting units occupy their initial positions and prepare to support the reorganization.

(6) Subordinate commanders report their status as prescribed in the battalion SOP. The reorganization is complete when all units are assembled, are accounted for, and battalion control is established.

(7) Supporting engineers or airlanded force personnel make LZ improvements or expand the LZ as necessary to facilitate future landings of personnel and supplies.

e. Conduct of the Ground Attack. The tactical situation may require the battalion to attack before completing its reorganization. In the absence of other orders, unit commanders decide when their units are ready to commence the attack. If the battalion becomes engaged upon landing, individuals should make full use of night vision devices, and other night operating aids to effectively gain and maintain the initiative. Night vision aids assist in reestablishing unit integrity at the earliest practical time.

(1) When the night attack objective is at a considerable distance from the LZ and enemy resistance is expected to be light, the battalion may use an approach march. Control and orientation of movement is simplified and more efficient using passive night vision devices.

(2) The reconnaissance platoon, supporting engineers, and other assigned reconnaissance and security forces move out rapidly to locate enemy forces; to disrupt enemy communication facilities; and to provide early warning, security, and information. When the objective area is defended lightly, security forces may land on or move directly to the planned combat outpost.

(3) Organic and attached antitank weapons using crew served weapons night vision sights cover approaches favorable to enemy armor. Elements of the battalion antitank platoon attached to the rifle companies are returned to battalion control. Landing the battalion near its objective facilitates support by the battalion mortar platoon since it reduces the frequency of displacement and the distance ammunition must be carried. Night procedures and equipment permit continuous support and facilitate displacement as required. Attached or supporting artillery provides fire support for security elements that are beyond range of the mortar platoon. Aerial rocket artillery, armed helicopters, and tactical air support augment artillery and antitank weapons and supplement the striking power of assault units in addition to maintaining air superiority over the battle area. When the battalion has seized its objective, it prepares for subsequent operations.

f. Subsequent Operations. After seizing the objective area, an AMIB may defend, link up with a ground maneuver force, conduct retrograde operations, or conduct further offensive operations as prescribed for other infantry forces in this manual and in FM 7–20.

g. Conduct by the Reserve. Reserves normally stand by in the pick up zone (PZ), formed by aircraft load, next to or ready for transporting helicopters. When flying time is a key factor, they may be placed in airborne status.

h. Combat Service Support. In the AMIB, the support platoon leader accompanies the assault echelon. The S4 may remain at a logistics base to insure adequate logistical support. Sufficient supplies accompany units into the objective area to meet their initial requirements. Subordinate units assigned offensive missions upon landing are not burdened with large amounts of supplies that they will have to recover and protect. Companies land with those supplies that can be carried on organic vehicles or by their personnel. A minimum size combat trains element lands with the battalion. Additional supplies are landed with and recovered by the battalion which establishes distribution points and sends supplies forward to the companies on battalion transportation. Units operating on separate missions or isolated from the battalion may be supplied by air. Followup supplies are delivered as close to unit positions as possible. As soon as landing facilities are available, aircraft may be used for evacuation of casualties, key prisoners of war, and items of immediate intelligence value.

Section III. AIRMOBILE INFANTRY COMPANY AND PLATOON

9–8. Airmobile Infantry Company

In addition to the airmobile infantry rifle company, the infantry, light infantry, and airborne rifle companies are particularly adaptable to night airmobile operations because their combat essential equipment can be moved by assault helicopter. The mechanized infantry rifle company can also conduct airmobile operations, less its heavier equipment on short notice. The airmobile infantry rifle company

has the ability to conduct airmobile operations over extended periods by having combat, combat support, and combat service support requirements provided by helicopter delivery. For further information on airmobile operations, see FM 7–20, FM 7–11 and FM 57–35.

a. Planning and Conduct. Though the airmobile company is capable of conducting separate night offensive operations, it normally attacks as part of an AMIB. Considerations, planning, preparation, and conduct of the night attack for the airmobile company are essentially the same as for the AMIB (fig. 9–2).

b. Subsequent Operations. After landing and completing assembly and reorganization on the LZ, the airmobile rifle company operates in substantially the same manner as discussed in chapter 7.

9–9. Airmobile Rifle Platoon

a. In airmobile operations, the airmobile rifle platoon normally fights as part of the airmobile rifle company. The rifle platoon may be required to fight independently or semi-independently during all or part of the operation. This may occur in the performance of a separate mission appropriate to a platoon or may occur as a result of having to fight immediately after landing in the objective area.

b. Planning, preparation, and conduct of the night attack by the airmobile rifle platoon parallels these actions for the airmobile rifle company and battalion discussed in this chapter.

(1) For additional discussions of planning for airmobile operations see FM 7–11, FM 7–20 and FM 7–15.

(2) After landing and seizure of the initial objective the airmobile rifle platoon operates in substantially the same manner as the infantry platoon discussed in chapter 7.

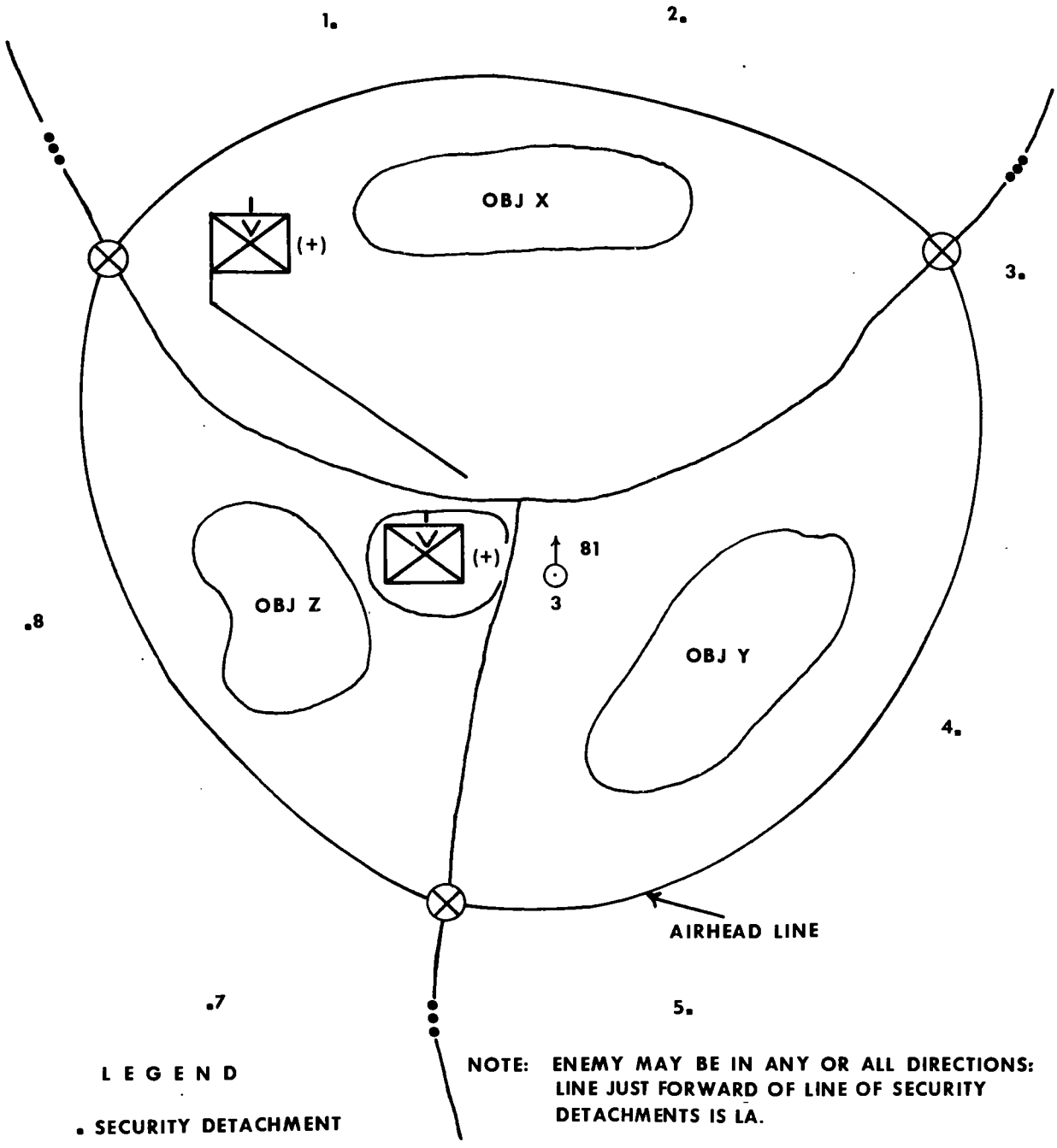


Figure 9–2. Scheme of maneuver, airmobile rifle company in the night attack (schematic).

CHAPTER 10
TANK-MECHANIZED INFANTRY TASK FORCE IN THE NIGHT ATTACK

Section I. GENERAL

10–1. General
Night combat operations are an integral part of tank and mechanized infantry operations. These units are well suited to execute night attacks. The major advantages and limitations of night operations have been discussed previously. The fundamentals involved in night operations are the same as those in daylight operations.

10–2. Organization for Combat
Tank-mechanized infantry task forces are normally employed in the attack because of their complementary capabilities. Either tank or mechanized infantry units are fully capable of conducting night attack operations as organized; however, when both types of units are available and the environment and tactical situation permits, they are usually task organized for the specific mission. The task force may be heavy with either tank or mechanized infantry units or balanced with each type force.

10–3. Application of Techniques to Organizations for Combat
The techniques of employment of these forces in the night attack are discussed using a task force organization for combat. It is emphasized that the techniques of the employment of pure tank or mechanized infantry battalion or organizations parallel the employment of subordinate like elements that are discussed herein. Although the pure tank and mechanized infantry battalion organizations are capable of operating as organized when such employment is dictated, they are normally task organized to capitalize on their complementary capabilities and to minimize their respective weaknesses.

Section II. TANK-MECHANIZED INFANTRY BATTALION TASK FORCE IN THE ATTACK

10–4. Basic Consideration of Night Attack
a. Night operations are conducted in basically the same manner as daylight operations. Offensive operations in smoke, haze, fog, falling snow, and other conditions of reduced visibility, also require the use of the special techniques of night attack. The problems of identification, control, coordination, and maintenance of direction are greater; dispersion is less; maneuver is restricted; movement is slower; and surprise and simplicity become major considerations. As more advanced night vision devices, navigational aids, and ground surveillance equipment are introduced, the task force capabilities increase significantly and the problem areas are reduced. For the present, limitations still exist although to a lesser degree, and the requirement for more detailed plans and specific techniques remains valid.

b. Night attacks are characterized by a decrease in range of aimed fires with a corresponding increase in area and close support fires by direct fire weapons. Troops must be well trained in operating during darkness. Such training and experience promotes individual and unit confidence and efficiency in the conduct of the attack. As a result of the reduced capability for control by higher commanders, effective leadership at task force level and below is essential. Commanders must be

capable and ready to take independent and aggressive action in the night attack.

c. Thorough daylight reconnaissance is important and every effort should be made to provide adequate time for reconnaissance so that all key personnel, in so far as possible, are familiar with the ground to be crossed. Adequate time must be available to permit a daylight reconnaissance to select—forward assembly areas; lines of departure; avenues of approach; and objectives. Subordinate leaders should view the area of operations during last light and after night has fallen. By this means they can firmly fix in their minds the locations and outlines of key terrain features in their zones of action.

d. Night attack plans must be simple. More time is required to plan and coordinate a night attack than a daylight attack. Consequently, decisions to attack at night should be made early. For example, the normally acceptable scheme of maneuver for a daylight attack of converging tank and infantry forces on the objectives normally should not be planned for night attacks. Instead, a single objective should be assigned to each manuever force. This different technique for night use precludes the possibility of friendly forces becoming intermingled or actually engaging each other. Simple, yet detailed plans improve the chances of success. Maximum use is made of terrain features, available equipment resources, and coordinating measures in disposing forces before the attack as well as in guiding them during the attack.

e. Coordination of nuclear fires with maneuver at night is difficult. Darkness increases troop safety considerations because of the degradation of vision. Obstacles created by nuclear fires are difficult to traverse at night and these fires may destroy landmarks which were to be used as control measures. These factors and their impact on the operation must be thoroughly evaluated prior to making a decision to employ nuclear weapons. Enemy use of nuclear weapons may affect the vision of attacking or supporting troops, causing them to be temporarily less effective. Residual fires created by nuclear or conventional weapons may assist in identification of objectives and maintaining direction but may also silhouette forces of either side.

f. The effectiveness of task force in the attack is materially increased by the use of the active and passive night operating aids that are organic to the component forces of the task force. The organic active aids include tank mounted searchlights (capable of infrared and visible illumination), infrared and visible driving lights, metascopes, laser range finders, ground surveillance radars, pyrotechnics, and flares. Nonorganic active devices include artillery searchlights and illuminating rounds (flares). Also available are lights and flares from Army and Tactical Air Force aircraft. Passive organic night operating aids include two categories of equipment: navigation aids, and image intensification vision devices. Navigation aids include individual and vehicular equipment that permit precise and instantaneous position location of the element and assist in maintaining the direction of movement of moving forces. These aids permit more rapid movement in close terrain and at night. They greatly assist in elimination of problems of disorientation and confusion that were previously unavoidable at night. Image intensification devices assist in maintenance of direction, command and control, and the night acquisition and engagement of targets. These include the starlight scopes (handheld or individual weapon mounted), crew served weapons night vision sights, night observation devices and passive tank gunsights.

g. Diffusion and reflection techniques are methods of increasing the light levels. The degree of effectiveness of passive night vision devices may be increased by the use of these techniques particularly when ambient illumination levels are very low.

10-5. Planning the Night Attack

Planning for the night attack is similar to that of a daylight attack. However, plans for the night attack are in greater detail with more stringent control measures to insure coordination within and between attacking and supporting elements. Subsequent paragraphs discuss areas that require emphasis in plan-

ning offensive operations at night or under conditions of reduced visibility.

a. General. The commander's decision to conduct a night attack must be disseminated to subordinate leaders in time to provide them an opportunity for reconnaissance, detailed planning, and coordination. The amount of planning depends on the time available, especially when task forces are continuing a daylight attack into the night. The commander must consider the inherent risks in such an attack. Nevertheless, attacks in progress are not discontinued merely because of nightfall. Task forces and subordinate units in the attacking echelon plan to continue the attack through the night unless ordered otherwise.

b. Planning Factors.

(1) Night attacks are either supported or unsupported. These two general types are further classified as either illuminated or nonilluminated. The type of night attack used depends on the area of operation, the tactical situation, and the availability of equipment.

(*a*) *Supported attack.* A night attack should be supported when the enemy is in well-organized positions and/or when the possibility of surprise is remote. Supporting weapons are employed for prepartory fires before the attack, supporting fires during the attack, and protective fires during and after the attack. Protective fires are designed to isolate the objectives and to prevent or limit hostile counterattack. These fires are employed in conjunction with otherplanned fires throughout the area to assist in deceiving the enemy as to the exact location, direction, and time of attack.

(*b*) *Unsupported attack.* An unsupported night attack is one in which the fires of all supporting weapons are planned, as for a supported night attack, but are withheld until a specified time or a specific event occurs. This time may be just before the final assault is launched, when the attack has been discovered and the need for secrecy is no longer of paramount importance, or when it becomes necessary to isolate the objective by fire to protect against counterattack. These attacks may be, but usually are not, illuminated. Primary reliance is placed on passive night operating aids to control the attack when not illuminated. Unsupported night attacks are usually employed when there is a possibility of bypassing or eliminating the outer defenses of the enemy position. During movements forward of the assembly area and before the assault begins, lights are prohibited and unnecessary noises are avoided.

(2) The decision to conduct a night attack and the night attack order must be disseminated early to provide for maximum response by subordinates and time for rehearsal by the attacking force. The initial warning order should include, if possible, the extent of reconnaissance to be conducted and measures to be taken to maintain secrecy and surprise.

(3) To maintain control, night objectives are normally more limited in depth than daylight objectives. The degree of limitation is dependent on terrain, training, and experience of the troops involved, and the disposition and strength of the enemy.

(4) If the attack is to seize favorable terrain for a succeeding daylight attack, it is usually advantageous to launch it during the final hours of darkness so that first light (BMNT) will be available for consolidation and for continuation of the attack, thus giving the enemy the least time to react.

(5) If the attack is to exploit a daylight success and the desire is to hit the enemy before he has time to establish his position, the attack may be conducted during the early hours of darkness.

(6) The attack should be planned so that the attacking force is oriented on one straight direction of attack. The force should not be required to execute complicated maneuvers which are difficult to accomplish in darkness.

(7) If two or more teams or task forces attack, care must be taken to separate and identify each objective and unit to preclude the possibility of one unit firing on another. Passive night vision devices are used by the maneuver teams to avoid such occurances.

(8) To maintain secrecy and surprise, the attacking force should move under the cover of darkness until forced to deploy by effective enemy fire or until it reaches a point where it can assault. Once the attacking force is dis-

covered, illuminated by the enemy, or has deployed for the assault, maximum illumination should be provided to facilitate control, movement, and aimed fire. For a mounted task force, illumination may be initiated at the probable line of deployment. For a dismounted mechanized infantry element using stealth, it may not be initiated until the unit has closed on the enemy's forward foxholes or, until the enemy places effective fires or illumination on the attacking force. Illumination should be terminated as soon as possible after consolidation begins. If secrecy cannot be maintained, the attacking force should initiate the attack with illumination directed at the objective and advance as rapidly as possible to seize the objective.

(9) The column formation should be used during the nonilluminated phase of an attack, and the line or wedge during the illuminated phase. Distance between vehicles should be reduced to that distance required to facilitate control (25–50 meters).

(10) Normally, consolidation is accomplished under cover of darkness. However, active and passive vision devices should be used to conduct surveillance of enemy avenues of approach until first light (BMNT) or until a surveillance effort has been established through the positioning of listening posts, patrols, and ground surveillance radars. Plans should be made for white light and/or flares if it is necessary to deny an avenue of approach to the enemy by exposing it, or if maximum illumination is desired, to engage a fleeing enemy or an enemy force conducting a counterattack.

c. Preparation of Orders. Overlay-type operation orders are usually used and follow the standard five paragraph format. Overlay-type orders include the following additional factors for the night attack.

(1) *Task organization.* If tank-mounted searchlights are going to provide illumination, the illuminating element should be shown as attached to the attacking unit.

(2) *Paragraph 1b, Friendly forces.* Nonorganic and nonattached units that will provide illumination (include status).

(3) *Paragraph 1c, Attachments and detachments.* Note the time the attachment begins and ceases for tank-mounted searchlight elements that will be used in an illumination role.

(4) *Paragraph 3a, Concept of operation.*

(*a*) *Maneuver.* Include whether the operation is to be illuminated or nonilluminated and either supported or nonsupported. The force (who is issuing order), objectives, and general scheme of maneuver to seize and consolidate objectives are presented.

(*b*) *Fires.* As in the day attack, the allocation and scheduling of fires to support the scheme of maneuver is included. In addition, definitive guidance on phasing of illumination in accordance with the night visibility plan NVP is included. Participating artillery and mortars are notified of their illumination missions. If employed, artillery searchlights and aircraft flares are included. The fire support coordinator plans for *all* types illumination available, including tank-mounted searchlights. All available illumination may not be employed nor considered necessary to support a given action; nonetheless plans are made for its use to cover contingencies. Because of the detail involved, it is normally necessary to prepare a NVP and an illumination appendix to the fire support plan at task force and higher levels if the NVP or the illumination plan is too lengthy for subparagraph 3a or the fire support annex. As a minimum, the following must be covered:

1. The planned time that illumination will be initiated.

2. The contingency for initiating illumination earlier, if required.

3. The extent of illumination.

4. Type and method of illumination to include orientation during movement, illumination of boundaries, and illumination of the objective.

5. The planned termination of illumination.

6. The on-call illumination for the defense of the objective.

(5) *Paragraphs 3b through necessary number.* These subparagraphs detailing specific tasks for subordinate units are allocated in the same way as in any other order. For

night operations, techniques of employment are directed to indicate the type of tank/infantry coordination required during the assault, e.g., tanks leading, infantry leading, or tanks and infantry on line. It may be necessary to direct the employment of specific rifle squads with specific tanks during the assault. This decreases unnecessary movement on the objective which, in turn, decreases the possibility of accidental engagement of one part of the friendly force by another. Since mopping-up operations are difficult at night, enemy strongpoints may be isolated or bypassed and then reduced when conditions, such as at first light, are more favorable. Distinct objectives for each element of the attacking force must be assigned and consolidation and defense of the area seized is facilitated. Very stringent control of subordinate units is dictated for night operations. This control is usually achieved by effective use of all night operating aids. Enveloping and flanking operations should be undertaken only after the most detailed planning has been made. The key is "keep the scheme of maneuver as simple as possible."

(6) *Paragraph 3, Coordinating instructions.* Identification of each unit of the attacking force and guides used in the initial phase of the attack must be covered in detail. Also included is the provision for and location of guides, and the location and breaching of both friendly and enemy minefields and obstacles. Provision of passive night devices and guidance for their use are included. Restrictions placed on size and movement of reconnaissance parties should also be included in this paragraph.

(7) *Paragraph 4, Administration and logistics.* The stockpiling of mortar and artillery illuminating rounds (if required) and any restrictions placed on the availability of illuminating means (ammunition supply rate) will be covered.

(8) *Paragraph 5, Command and signal.* Under SIGNAL, the maintenance of dummy FM nets, when required by higher headquarters, the duration and termination of listening silence, and alternate means of communication will be specified. Alternate means of communication (i.e., flares, lights, etc.) must be planned for the initiation and termination of illumination and supporting fires.

d. Reconnaissance. A detailed day and night reconnaissance should be made of the routes of march, attack positions, positions for searchlights, and platoon points of departure. Daylight reconnaissance of terrain not held by friendly troops may be accomplished from aircraft and from vantage points controlled by friendly units. Reconnaissance should be conducted by all levels down to platoon as a minimum and lower if time permits. When a passage of lines is required, the reconnaissance should be conducted jointly with the units in contact. It should include as a minimum location and identification of guides from units in contact, routes through friendly positions, and locations of known minefields and obstacles. Air photographs of the area over which the attack is to be conducted should be obtained and distributed at least to company teams. It may be necessary to send out patrols using starlight scopes to obtain detailed information of the terrain and of the location and strength of enemy security elements. Every effort is made to locate enemy minefields and plans are made before the attack to breach these and other obstacles. Passive night vision devices assist greatly in accomplishing breaching of minefields and wire prior to the attack.

e. Surprise and Secrecy. In a night attack, surprise is obtained mainly through secrecy. Measures to obtain secrecy include—

(1) Restricting the size and time of parties engaged in reconnaissance and other preparations. Transportation should be provided for frontline reconnaissance and coordination by the unit in contact.

(2) Using artillery and mortar fire to cover the sound of movement of tanks and armored personnel carriers.

(3) Conducting local attacks in areas not designated for the night attack.

(4) Attacking at a time and from a direction heretofore not used against the enemy. Standard patterns, including methods of attack, are avoided.

(5) Illuminating areas other than the attack area to mislead the enemy.

(6) Imposing radio listening silence, at least until reaching platoon points of departure and preferably to the probable line of deployment (PLD). Alternate means of communication must be planned for and maintained. Wire must be used for personnel marking the platoon points of departure, and when employed, for infantry securing the PLD.

(7) Conducting the attack without illumination until the attacking force is exposed by the enemy or until it reaches the PLD and beyond if the enemy has not detected the attack. Control is maintained using passive devices. During the nonilluminated phase, strict light and noise discipline must be maintained. Radio loudspeakers must not be in operation. *All* internal lights (including red dome lights, radio lights, etc.) must be out. A last minute check before crossing the platoon points of departure must be made to insure that external lights are also out. If IR driving lights are used, blackout markers and the blackout stoplight must be covered.

f. Control Measures. Attack positions, lines of departure, contact points, boundaries, directions of attack, final coordination lines, and objectives are used for the night attack control measures in the same manner as in daylight attacks (fig. 10–1). The following additional control measures are used.

(1) *Limit of advance (LA).* To retain control and prevent the assault echelon from being endangered by friendly fires, the commander establishes an LA. This limit should be easily recognizable under conditions of reduced visibility. It should be far enough beyond and to the flanks of the objective to allow space for security elements to perform their mission. Fire support agencies can engage enemy forces beyond this limit without clearance from the supported unit.

(2) *Point of departure (PD).* This is the point where the attacking platoons cross the line of departure. Platoons normally cross in column formation. The PD should be readily identifiable and if necessary, guides should be posted to facilitate control.

(3) *Probable line of deployment (PLD).* PLD should be an easily identifiable terrain feature (road, trail, or other feature). This is the line where the unit assumes its assault formation if enemy contact has not been made.

(4) *Final Coordination Line (Final CL).* A line close to the enemy position used to coordinate the lifting and shifting of supporting fires with the final deployment of maneuver elements. It should be recognizable on the ground and may in some cases coinside with the PLD.

g. Illumination.

(1) If there is little or no chance of surprising the enemy, artificial illumination may be used as soon as the attack is launched. If surprise can be gained, illumination may be withheld until the enemy places effective fires upon the attacker. In any event, illumination must be planned for and employed when the enemy fires become effective or if he chooses to illuminate the battlefield himself.

(2) Battlefield illumination facilities control and coordination within the attacking elements, permits delivery of aimed fire, and allows rapid minefield removal and evacuation of casualties. For a discussion of planning and coordination of battlefield illumination, see chapter 3.

h. Fire Support.

(1) In a night attack, supporting fires are planned and controlled in the same manner as in a daylight attack. Protective fires for flanks of units and to isolate the objective in the attack must be planned. They may be employed before, during, and after the attack. To assist in gaining surprise, the attacking force may advance within assaulting distance of the objective without supporting fires. Once the assault on the objective begins, fires are delivered to isolate the objective, prevent or limit counterattacks, and support the assaulting force. Once visible illumination is provided, restrictions on supporting fires may be lifted.

(2) Nuclear fires may be used just before the attack to neutralize known hard targets. The employment of on-call nuclear fires should be avoided. The exact location and protective measures afforded the attacking troops may be difficult to determine. Special precautions must be taken to increase troop safety con-

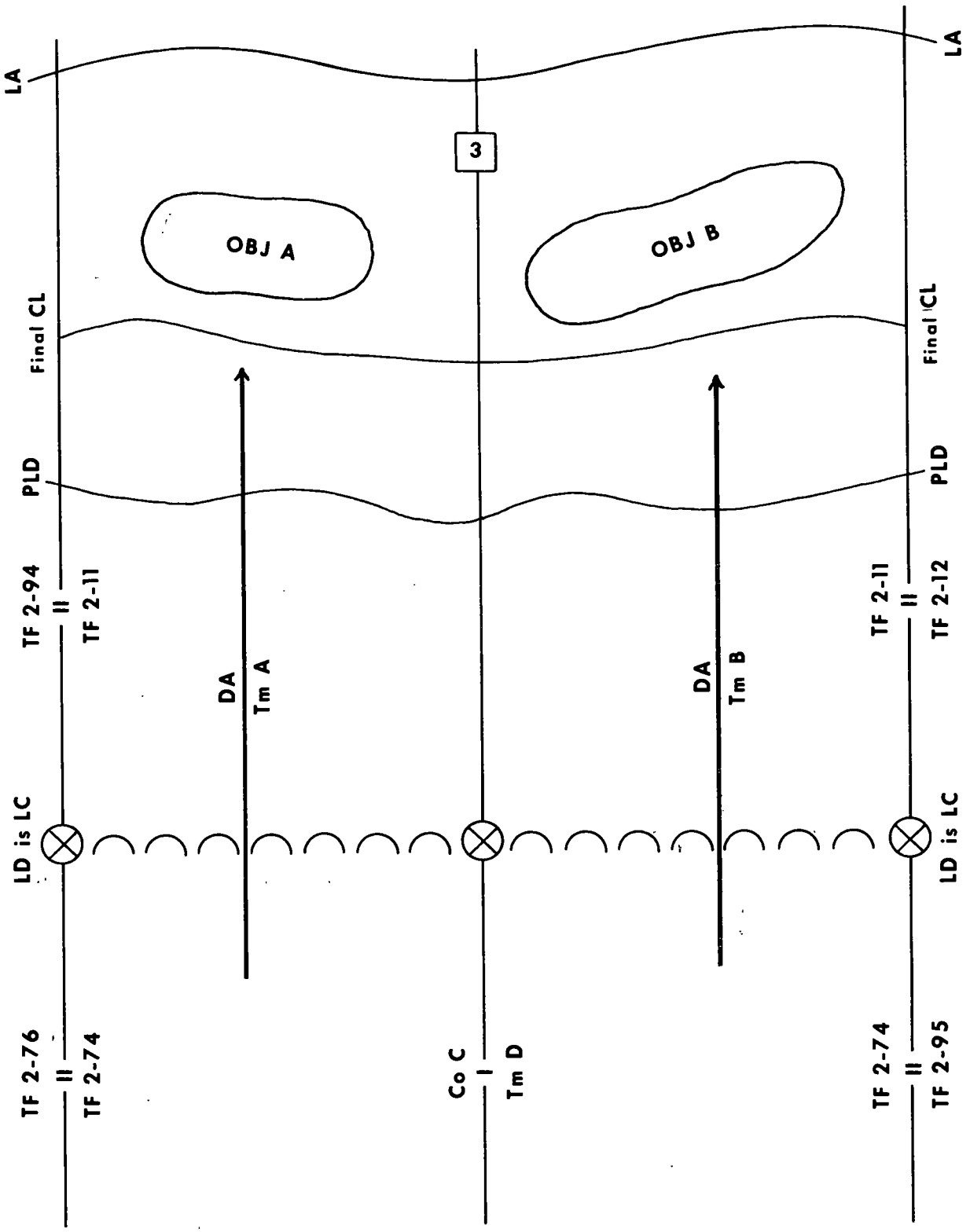


Figure 10–1. Task force control measures for the night attack.

siderations because of dazzle effect at night. The creation of obstacles is to be avoided as they are more difficult to negotiate at night. Nuclear fires may obliterate landmarks that were to be used as control measures.

(3) Normal fires are maintained before and during an unsupported attack. They do not alert the enemy to an impending attack but do assist in maintaining secrecy by muffling the noise of advancing tanks and armored personnel carriers.

(4) Positions for supporting weapons are reconnoitered and marked, and firing data is prepared during daylight. Weapons are moved under cover of darkness. In a night attack by a battalion task force, it may be desirable to provide all supporting fires from units not in the task force. When this is done, all the task force supporting weapons can follow the attacking echelon to the objective by bounds.

i. Communication. Radio is the primary means of communication in the mounted attack. Listening silence may be imposed on the attacking force to mislead the enemy as to the intentions of the moving tracked vehicles. When the enemy discovers the attack, listening silence is lifted. Dismounted mechanized infantry elements given the mission of breaching minefields and securing the PLD should use wire communications until the attack is covered. In any event, use of supplemental means such as pyrotechnic signals, infrared searchlights, and electronic devices is planned and employed.

10-6. Preparation for the Night Attack

a. Control over a unit is facilitated by prior training in the use of night vision equipment. Commanders insure familiarity of all personnel with the plan and insure maximum reconnaissance by leaders down to tank or squad level. Detailed orders, simple plans, and SOP are also vital to control.

b. In the night attack, emphasis must be placed on selected control measures such as objectives, boundaries, phase lines, and checkpoints that are easily identifiable at night. IR equipment, radar, passive night vision devices, navigation aids, and guides are used as appropriate to assist in the movement of individuals and vehicles. Illumination may be used to mark boundaries. Techniques that can be employed to provide orientation and to maintain direction are—

(1) Flares dropped beyond and on line with the objective.

(2) Artillery targets engaged on a time schedule so that friendly forces can orient on the bursts.

(3) Tracers from cal .50 weapons, fired at irregular intervals can delineate boundaries, routes, and objectives.

(4) Guides equipped with infrared lights may be posted on routes, PD's, and the PLD.

(5) Surveillance radar and the night observation devices may be used to monitor the movement of advancing units to report and correct any deviation from the prescribed route. Radars may also be used to cover flanks of the attacking force to determine enemy movement against the flanks or movement of the attacking force outside its boundaries.

(6) Easily identifiable terrain features, such as hills, unusual terrain formations, trees, or manmade objects can be used in conjunction with the above for orientation.

10-7. Artificial Lighting of the Battlefield

a. General. Battlefield lighting consists of active lighting systems that use visible light and invisible (infrared) light from manmade sources. The efficiency of these sytems is greatly reduced by fog, haze, rain, dust, smoke, and snow.

b. Visible Illumination. The employment of visible light has been the most common means of increasing the range of vision during darkness to date. Examples of visible battlefield illumination are ground signals, illuminating grenades, trip flares, artillery and mortar delivered illumination rounds, aircraft delivered flares, and searchlights. The observer needs no special equipment to use this system. The chief disadvantage of the use of visible light is its inherent lack of security. Enemy forces are immediately alerted and often the light can be of considerable benefit to the enemy if the illumination is not carefully planned. Searchlights often become targets and while the fire they draw may be ineffective from the standpoint of destroying the searchlight, the

light does provide an aiming point for the fire into friendly elements in the vicinity.

c. Infrared (IR) Illumination. Examples of equipment that use IR illumination are metascopes, IR weapons sights, IR electronic binoculars, IR searchlights, and IR periscopes and telescopes. These devices have greater inherent security than systems using visible light since IR radiation cannot be detected by the naked eye. Although simple devices can be used to detect IR at ranges of several miles, their field of view is restricted, and therefore the observer must not only be using the proper equipment but also be looking in the right direction to detect the IR source. These factors, in addition to the technique of employing the IR sources intermittently, greatly reduce the probability of detecting IR devices. The IR viewing component of this system may be used to detect enemy IR illuminators. IR illuminators cannot be used effectively in the indirect (reflected) mode.

d. Employment of Active Lighting System (Visible and Infrared).

(1) *General.* Active lighting systems in operation can be detected by the enemy; therefore, active systems are controlled and coordinated closely by the commander directing the operation.

(2) *Planning.* In addition to normal planning for combat operations, commanders must—

(*a*) Prepare an illumination plan as part of the NVP and insure its integration into the plan of fire support (fig. 10–2).

(*b*) Prepare a surveillance plan as part of the NVP for the employment of passive visual, infrared, and audio devices and techniques.

(*c*) Consider the use of all appropriate night vision equipment in the night visibility plan and, consistent with other tactical considerations, insure that the most efficient use is made of their capabilities.

(*d*) Insure the provision of an adequate communication network.

(*e*) Provide, where possible, for daylight reconnaissance in the selection of primary and alternate night operating aid positions.

(*f*) Consider the obscuration that may be caused by the effects of supporting fires since dust and smoke may diffuse illumination and act to the disadvantage of friendly forces.

(*g*) Assure that control of illumination means is vested in the commander having overall control of the operation. The use of all illuminating devices should be covered by unit SOP with special instructions being issued in operations orders.

(*h*) Consider the time of illumination in relation to the factors of security and surprise.

(*i*) Provide for adequate logistical support when large amounts of illuminating munitions may be required.

(3) *Indirect illumination.* Indirect illumination may be obtained by visible light through diffusion or reflection. Since the light is not directly visible, the location of the light source is difficult to detect and, therefore, the position need not be changed frequently. Tank searchlights may be, but are not normally, used for indirect illumination since this use limits the use of the tank weapons. The primary source of indirect illumination is the artillery searchlight (ch 3).

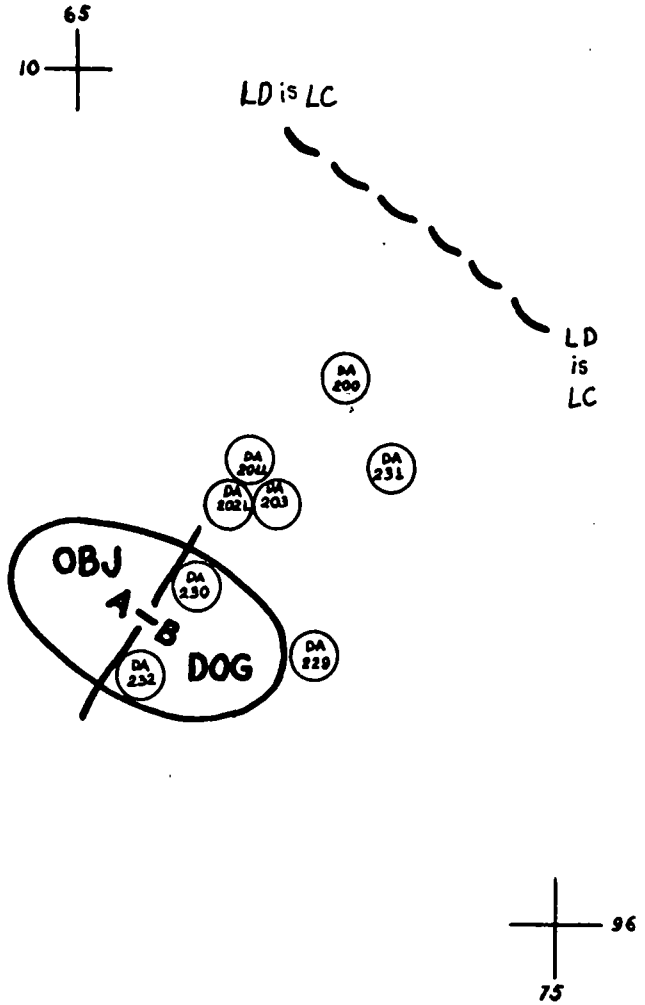
(4) *Direct illumination.* In planning the use of direct illumination, the commander should insure that the illumination means illuminates the enemy position or formation, so that effective fire may be placed on him, while the friendly force remains unilluminated. Techniques to be used in direct illumination are dependent upon the characteristics of the area to be illuminated, atmospheric conditions, illumination means available, and the tactical situation. For employment of tank searchlights, see paragraphs 10–12 through 10–18.

(*a*) *Pyrotechnics.* The employment of pyrotechnics, in addition to the considerations affecting all illumination systems, is based on a further consideration of—

1. Range of delivery weapon on aircraft.

2. Area and duration of effective light.

3. Temporary loss of supporting fires during illumination firing.



(Classification)

Copy No. 2
2d Inf Bn, 91st Inf (Mech) (TF 2-91)
GAUBUTTELBRUNN (6399), GERMANY
071800 June 19___

Appendix 1 (Illumination Plan) to Annex A (Fire Support Plan) to OPORD 31.
Reference: Map, GERMANY, 1:25,000, GIEBELSTADT sheet.

1. TF 2-91 Inf will conduct a mounted, illuminated attack 080100 June 19___ to seize designated objectives with two teams; Team A on the north and Team B on the south.
2. Illumination will begin and cease on task force order.
3. Execution of illumination plan will be controlled by Arty LO with TF 2-91 Inf.
4. Code word to call for illumination ..... FIDDLE.
   Code word to extinguish illumination..... AGONY.

Table of Description

Target	Description	Coordinates	Altitude	Area	Remarks
DA 200	Mechanized Co	69620310	280	680 m	Illuminating shell, 155-mm H diamond, or 4.2 in diamond, on call.
DA 201L	Road Junction	68580190	300		SLT, 1/2, Diffused, H-hour.
DA 202L	Road Junction	68500120	294		SLT, 1/2, Diffused, H-hour.
DA 203	Entrenchment	68840110	300	400 m	SLT, 1/4, Direct or 4.2 in diamond, on call.
DA 20F	1 June	6709	77	400 m	155-mm H diamond.
	L8 Area 1	0102770	300		
DA 229	Road Junction	69939872	291		SLT, 1/2, Diffused, or 4.2 in diamond, on call.
DA 230	Objective	67209924	300	600	SLT, 1/4, Direct, or 155-mm or 4.2 in diamond, on call.
DA 231	Road Junction	70500243	280		SLT, 1/2, Diffused, or 4.2 in diamond, on call.
DA 232	Road Junction	67019818	305		SLT, 1/2, Diffused, or 4.2 in diamond, on call.

Acknowledge.

Jones
Lt Col

Distribution: A
TF 2-92 Inf
2-22 Armd Cav

OFFICIAL:
/s/ Redlegs
REDLEGS
S3

(Classification)

Figure 10-2. Visible illumination plan.

(*b*) *Searchlights.*

1. Visible searchlights. Searchlights used in direct visible illumination give more intense illumination on a target area than when used indirectly (fig. 10–3). The intensity of illumination on the ground decreases gradually as the range from the searchlight increases. Minute atmospheric particles reflect the beam and reduce the ability of the observer to see the target area. This effect may be reduced by positioning the observer to the flank of the light. Objects silhouetted between an observer and the lightbeam are clearly visible to a range of several hundred meters. The efficiency of direct illumination is affected by atmospheric conditions, natural night light, the reflectivity of the illuminated surfaces, and shadows. Visible searchlights used in direct illumination should be operated intermittently and moved often to alternate or supplementary positions. This not only decreases the ability of the enemy to bring effective fire on the position but also provides greater surprise illumination. The tank-mounted searchlight is the searchlight most commonly available to task force commanders. A detailed discussion of the employment of tank-mounted searchlights is discussed in paragraphs 10–12 through 10–18.

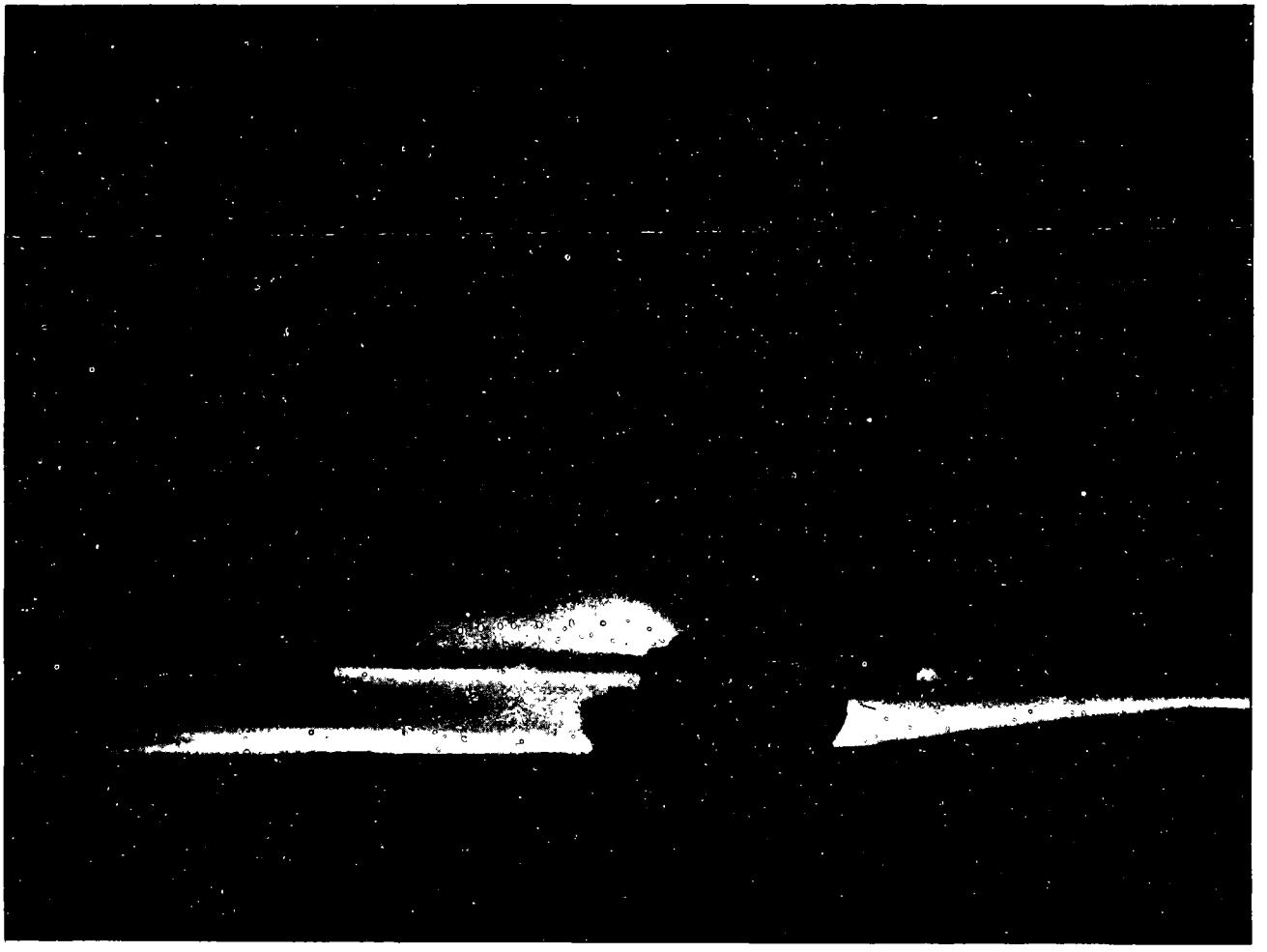


Figure 10–3. Visible direct illumination.

2. Infrared searchlights. This type searchlight is used in direct IR illumination and is employed similarly to the visible searchlight. It is best employed to illuminate checkpoints or areas which have been previously plotted on a range card. With the narrow beam, the amount of terrain illuminated is too small for systematic and complete coverage of an assigned angular sector. Use of the beam spreader further reduces the range which prevents the proper coverage of an assigned sector. Employment of the system in the "spot check" manner has the additional advantage of brief periodic operation. This reduces the vulnerability to attack from an infrared-equipped enemy and achieves better results at the illuminated point because of the surprise illumination.

e. Selection of the Means of Illumination. For a discussion of factors involved and influences of tactical situations, see chapter 3.

10-8. Scheme of Maneuver

The amount of maneuver possible during a night attack depends mainly on the nature of the objective and specific visibility conditions. It is difficult to change direction. Complicated maneuvers are avoided to decrease the danger of firing on friendly troops. Attacks normally are made in one direction and in a relatively close formation to facilitate control. Nevertheless, simple maneuvers may be used by tank and mechanized infantry units employing vehicular navigational aids, night vision devices, and infrared equipment. Use of these devices provides much better control than heretofore possible.

a. Attack Formations.

(1) *Task forces.* In an attack that is not illuminated initially, task force company teams cross LD in line formation with platoons in column. Mechanized infantry platoons may be in column behind tank platoons. Intervals between company teams are such that units can deploy when necessary. Deployment by platoons to the line formation is made when forced by enemy action or at the PLD in order to attain maximum firepower and shock effect. In an illuminated attack with supporting fires or when light levels permit effective use of passive night vision devices for orientation and control, platoons may employ the line formation from the attack position to the objective. In any event, the rate of advance is timed to permit a simultaneous assault on the objective by the leading units.

(2) *Mechanized infantry dismounted units.* Mechanized rifle units may use dismounted formations as described in chapter 7 for the night attack when not illuminated, and where terrain or security preclude tank movements. Plans for support by tanks are prepared and tank elements join the dismounted elements in the attack when the attack is discovered.

(3) *Mechanized mounted units.* Mechanized rifle units may also conduct a mounted night attack with or without illumination, the decisive factor being whether secrecy is desired. Although the enemy can usually detect a mounted attack, his ability to do so can be limited by the use of artillery and mortar fire to cover the sound of carriers and tanks. Illumination may be withheld until the enemy places effective fire upon the attacking force, at which time the remaining phases of the attack are conducted as in a daylight attack. Illumination does not preclude the use of night driving, vision, and firing devices.

b. Distribution of Forces in the Attack. An attacking force at night *usually* employs three elements. These are—the maneuver force; the base of observation, illumination, and fire (BOIF) force; and the reserve force.

(1) *Maneuver force.* The tank and mechanized rifle platoons, organic or task organized into company teams from tank and mechanized infantry battalions respectively, provide the maneuver elements for the mounted night attack. The maneuver force closes with and destroys the enemy in the night attack.

(2) *Base of observation, illumination, and fire (BOIF) force.* The attacking force establishes a VOIF. It also maintains direct and overwatching observation of known or suspected enemy positions. The BOIF provides illumination, if required, or acts to counter enemy night vision aids. It also assists in target acquisition. In addition, the BOIF provides organic indirect and direct fire to support the attack. The BOIF usually in-

cludes the larger and longer range night vision devices such as the night observation device and crew served weapons night vision sight. It also incorporates organic ground surveillance radar. In addition, the BOIF may have tanks designated to provide passive surveillance and observation using the tank sights and searchlight illumination (invisible and IR mode) to acquire enemy targets. Tanks used in the BOIF also provide supporting fires for the maneuver force.

Note. Assignment of tanks to the BOIF results in a reduction of maneuver force capability and should be the minimum size element consistent with the mission requirement of the BOIF and other elements available for use in the BOIF).

(3) *Reserve force.* The commander for either a task force or organic force usually constitutes a reserve to influence the action, normally from forces suitable for maneuver. The reserve is placed well forward behind the maneuver elements at night. Reserves are employed to exploit success, maintain the momentum of the attack, defeat enemy counterattack, provide security by protecting the flanks and rear of the maneuver force, and to reinforce the attack. The task force or battalion normally constitutes a reserve at the task force/battalion level only. The proper employment of night operating aids makes commitment of the reserve to influence the night attack practical. This reserve may in fact be tank elements of the BOIF. The company team in the attack is an assault element and generally does not constitute a reserve. Similarly platoons do not retain reserves.

c. Time of Attack. Time patterns are avoided to facilitate surprise. Consideration must be given to the mission and enemy situation. If the attack is to seize favorable terrain for a succeeding daylight attack, it may be launched during the final hours of darkness to give the enemy minimum time in which to interfere with the subsequent attack. However, attacks launched during early darkness permit the attacker to take maximum advantage of a long period of darkness and exploit the enemy's confusion and loss of control. Ambient illumination levels must be considered in determining the time of attack. Attacks may be initiated during darkness and continued without pause during daylight.

10–9. Conduct of the Night Attack

a. The attacking maneuver forces cross the LD at the time prescribed by the operation order. Commanders are well forward to insure aggressive movement of their units, maintenance of direction, and coordination with other units and the BOIF. All leaders must exercise close control over their elements to prevent premature assault. Positive orientation, movement, and control of the maneuver force is possible by fully using the passive night vision devices. The goal is to conduct a nonilluminated attack as far forward as possible then conduct the action from the point of discovery to the consolidation of the objective in a manner similar to a daylight attack with maximum illumination.

b. Enemy security forces encountered during the advance are disposed of by the leading attack elements. This action may require engaged elements to deploy before the planned time; however, they attempt to eliminate opposition without illumination and to continue the movement with assistance of passive night operating aids. Adjacent units may continue to advance during this action. Following units may be committed around the flank of the engaged unit and assume its mission. After the resistance has been reduced, engaged units may reform and follow the maneuver force. This technique is effectively used in an attack of a deep objective. In any event, the entire attack should not be halted because of engagement by leading elements with enemy security forces. If the resistance is such that commanders may lose control or receive effective enemy fire during the attack, visible illumination may be employed and the advance continued as in a daylight attack.

c. The goal to be achieved in the night assault is the same as in a daylight assault. Deployment by platoons to line formation is completed without halting; any prolonged halt at this stage of the operation increases the chance of detection and allows the enemy time to redispose his force on the objective. Mechanized infantrymen remain mounted until

dismounted action is required. They make maximum use of starlight scopes to maintain orientation and assist in detection of enemy positions when open hatch movement is possible. When further surprise cannot be achieved, the visible illumination plan is executed or the level of illumination is increased. Mechanized infantry is dismounted on or before the objective to allow the force to place its maximum aimed and concentrated firepower on the enemy. The key to firepower in the assault is volume. The key to shock effect is moving tracked vehicles. Every effort is made to maintain the line formation and prevent it from breaking into isolated groups.

10-10. Actions on the Objective

Security elements equipped with passive and IR night vision devices are sent out far enough to warn of enemy forces forming for counterattack within assaulting distance of the captured position. If they are required to go beyond the established limit of advance, their movements are carefully coordinated with the BOIF. Consideration must be given to the use of IR illumination during the consolidation and reorganization of the objective. This is necessary because the attacking unit will suffer from night blindness for about 30 minutes after extinguishing visible lights. Before daylight, all elements should be in position, prepared to continue the attack or defend the position.

10-11. Exploitation and Pursuit

a. General. Exploitation is a type of offensive operation that may follow a successful penetration. Exploitation takes full advantage of success in battle and is dependent upon retention of the initiative. Pursuit is a phase of exploitation that has as its primary purpose the capture or destruction of a retreating enemy force. The possibility of a night exploitation following successful daylight or early night attacks must be considered and planned for in the development of the initial attack plan. An exploitation force operated through a gap or around a flank usually is assigned a physical objective deep in the enemy rear. At night the pursuit must also use terrain objectives as control measures. In addition, a direct pressure force is used to permit the pursuit force freedom from enemy flank attack, otherwise, the conduct of the pursuit at night is identical with the exploitation. The exploiting force strives to reach the objective with maximum force in the shortest possible time. The exploiting force does not concern itself with any actions of the enemy except those that could seriously interfere with, or prevent accomplishment of, the assigned mission. Thus, enemy forces frequently are reported and bypassed with the permission of the next higher commander. Terrain permitting, night exploitation forces advance on a broad front using multiple team directions of attack for the task force. Use of passive night vision devices permit rapid, controlled movement. When the exploitation stage has been entered, the local enemy situation will almost certainly be one of confusion and partial disorganization. A rapid expansion of the attack will further cause the enemy dispositions to disintegrate. Enemy resistance will consist mainly of delaying actions by small units, defense of scattered dispositions, and reliance on obstacles, both defended and undefended. As the attack penetrates deeper into the enemy's defenses, his disorganization increases proportionately. Objectives in enemy rear area include—enemy reserves and artillery; command, communications, and supply installations; the rear or flank of strongly held positions; vital terrain features or critical points, such as defiles, road junctions, railroad centers, and bridges; linkup with friendly airborne or airmobile forces; and enemy nuclear delivery agencies or storage sites.

b. Planning. Planning for a night exploitation must be made prior to the penetration or attack to seize the initial objectives which are usually located in relatively shallow depth. With the night operating aids it is possible to conduct an exploitation at night. Against a strong but shallow defense, consideration should be given to attacking initial objectives in order to effect a penetration of several thousand meters and then to enter the exploitation phase. The controlling maxim is surprise, speed, and retention of the initiative. The attack should be pushed, making maxi-

mum use of night operating aids. The plans for seizure of the initial objective(s) are as described in the preceding portions of this chapter. Command in any exploitation depends, to an unusual degree, on aggressiveness, initiative, boldness and understanding of tactics, constant alertness, and the appearance of force. A thorough knowledge of the higher commander's plan will assist in carrying out the assigned mission. This is even more essential in a night exploitation. The attacking force must be controlled so that it can react quickly and best apply its force. Passive and active night operating aids assist in the maintenance of positive control. Strict march discipline is a basic requirement. In addition, each commander is responsible for the security of his unit. A task force engaged in exploitation is, because of its position deep in enemy territory, particularly vulnerable to enemy attack on its flanks and rear and to harassment by small pockets of resistance and guerrilla forces. Therefore, security becomes increasingly important. This security is normally provided by company teams using passive night vision devices operating on exposed flanks and by maintenance of internal contact between advancing teams.

c. Scheme of Maneuver. Control measures and capabilities which assist in providing positive control without excessive reduction in speed of movement are the principal differences in capability that permit a night exploitation. The control measures required are depicted in figure 10–4. Usually it is not practical to achieve the detail in planning for the night exploitation that is considered necessary in the night attack. Provisions must be made to use the following control measures. *The limit of advance* (*LA*) for the initial attack is designated as the *line of departure* (*LD*) for the exploitation. Therefore, the LA is the LD. Since the enemy situation usually is not known and night procedures are required, four basic control measures are employed. They are direction of attack, conditional lines of deployment, probable line of deployment, and limit of advance. *Direction of attack* (*DA*) is assigned for each team (to prevent confusion and preclude engagement by friendly forces). The anticipated lack of firm intelligence of the enemy requires the provision of control means to rapidly deploy the exploitating force at any point in the advance. This is achieved by establishing *conditional lines of deployment* (*CLD*) along clearly defined terrain features perpendicular to the direction of attack. The CLD performs the same function as the phase line in daylight operations; however, they must be much closer together than are phase lines since in addition to providing the command tool to control the rate of advance, they also provide the control basis for deployment for engagements with the enemy short of the PLD. The CLD and the team DA provide for positive control of flank security elements, the BOIF, and the indirect fire support. A PLD is established for the final deployment control prior to attack of the exploitation objective. The task force assigns separate objectives for each attacking team and a task force LA.

d. Fire Support. Supporting fires to include illumination are planned along the direction of advance as discussed earlier in this chapter.

e. Conduct of Exploitation. The exploitation is conducted as planned with as few deviations as possible. The flexibility normally permitted for daylight operations is not feasible at night. The BOIF must move by bounds with or behind the attacking elements and, after initiation of illumination, must displace in a manner which permits continuous illumination support to the maneuver force. Upon completion of the attack on the final objective, normal actions on the objectives are accomplished.

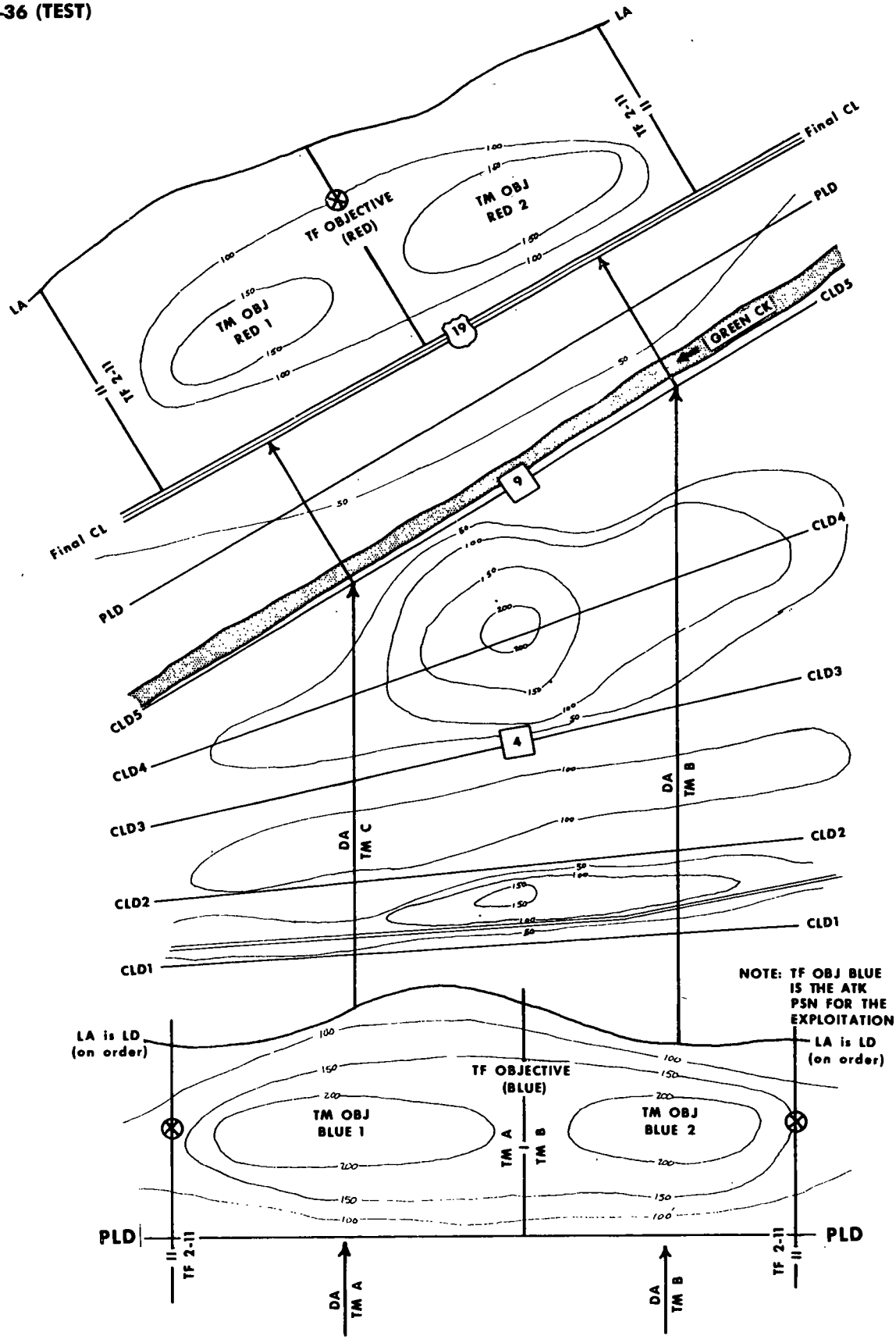


Figure 10–4. Task force control measures in the night exploitation.

Section III. COMPANY TEAM IN THE NIGHT ATTACK

10–12. General

This section discusses specific considerations for the company team in a night attack. Information contained in this section must be used in conjunction with the other material in this chapter.

10–13. Basic Considerations

a. The importance of a physical, daylight reconnaissance must be emphasized during the planning phase. Whenever possible, subordinate leaders, to include individual tank commanders and squad leaders, should be afforded the opportunity to travel approach routes, select positions in the forward assembly area, identify the LD, and observe the terrain leading to the objective. If possible, this reconnaissance should be conducted just prior to last light and continue until after nightfall. Use of passive observation devices may materially aid in the accomplishment of the reconnaissance.

b. When a passage of lines is required, reconnaissance should be conducted jointly with units in contact. Reconnaissance must include, as a minimum, the location and identification of guides from tactical units in contact and designated routes to pass the attacking force through friendly positions, minefields, and obstacles.

c. In the event the BOIF is employed along the FEBA, locations of tank-mounted searchlights, night observation devices, and ground surveillance radars are identified. Occupation of these positions should be accomplished prior to nightfall, provided security of the mission is not compromised. In the event occupation of positions cannot be accomplished prior to dark, azimuths and elevations to prominent points and target areas are recorded. Positions should be located as accurately as time and facilities permit, and consideration given to the location of vital friendly installations that could be damaged by enemy action directed at the searchlights.

10–14. Planning the Attack

In addition to those considerations outlined in paragraph 10–5 the following techniques are applicable to the team plan (fig. 10–5).

a. General. Attack positions, directions of attack, lines of departure, contact points, boundaries, and objectives are normally used for control during a night attack.

b. Points of Departure (PD). A point on the FEBA or line of contact designated by the team commander where the attacking platoons cross the LD in column formation. This point must be readily identifiable, and guides with recognition signals must be stationed there.

c. Direction of Attack (DA). A direction used to restrict the lateral movement of the teams/platoons for control purposes until the PLD is reached. (It should be located on or near easily identifiable terrain features.) Platoons remain in column until either forced to deploy by effective enemy fire or until the PLD is reached. Direction of attack is designated by the commander conducting the operation.

d. Probable Line of Deployment (PLD). This is the point on the ground where the commander visualizes that the teams/platoons must deploy on line to assault the objective. (It should be located on or near easily identifiable terrain features.) If not forced to deploy before the PLD, this is the point where illumination is normally initiated and radio listening silence lifted. If tanks are employed in a fire and illumination role overwatching a dismounted infantry force, illumination may be withheld until the attacking infantry has closed on the enemy forward foxholes. The PLD is designated by the commander conducting the operation.

e. Final Coordination Line (Final CL). A line close to the enemy position used to coordinate the lifting and shifting of supporting fires with the final deployment of maneuver elements. It should be recognizable on the ground.

f. Limit of Advance (LA). This is a line beyond and to the flanks of the objective that is designed to limit the maneuver of the attacking force so that it will not be endangered by friendly fires. It must be easily identifiable and must be far enough beyond the objective

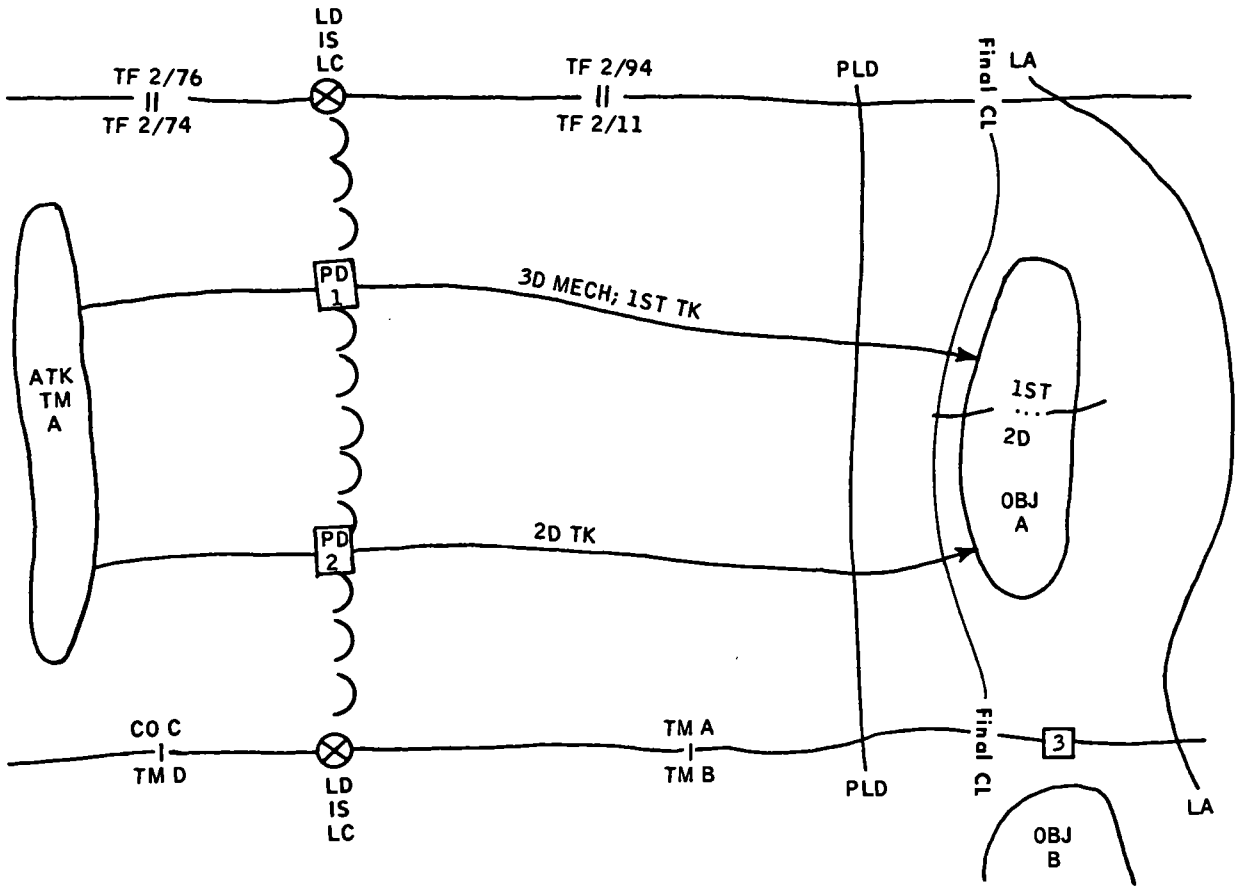


Figure 10–5. Team control measures for the night attack.

for security elements to perform their missions. The LA is designated by the commander conducting the operation.

g. Orientation and Night Navigation. Maintaining direction while moving is extremely difficult at night during nonilluminated operations; consequently, measures taken must insure that the attacking platoons are oriented on the objective. Techniques that may be used for oreintation and to maintain direction are as shown in (1) through (10) below (fig. 10–6).

(1) *Flares.* Flares can be dropped at irregular intervals beyond and on line of the objective.

(2) *Artillery targets.* Artillery or mortar bursts may be fired on key terrain forward or to the flanks of the advancing force. White phosphorous (WP) ammunition is very effective for this purpose, provided the wind is not blowing toward the friendly forces.

(3) *Tracers.* Caliber .50 machinegun fire provides the best tracer element upon which to guide. These tracers can be fired at irregular intervals to delineate boundaries and to designate the objective.

(4) *Patrols.* If patrols operate beyond the FEBA, guides with filtered lights or the IR light from the metascope may be posted from the platoon PD to the PLD.

(5) *Infrared illumination.* If the enemy has a limited infrared detection capability, IR may be used as illumination of the maneuver area and to delineate boundaries.

(6) *Radars.* Short range ground surveillance radars may be oriented along a DA to report and correct deviations in direction of the attacking force.

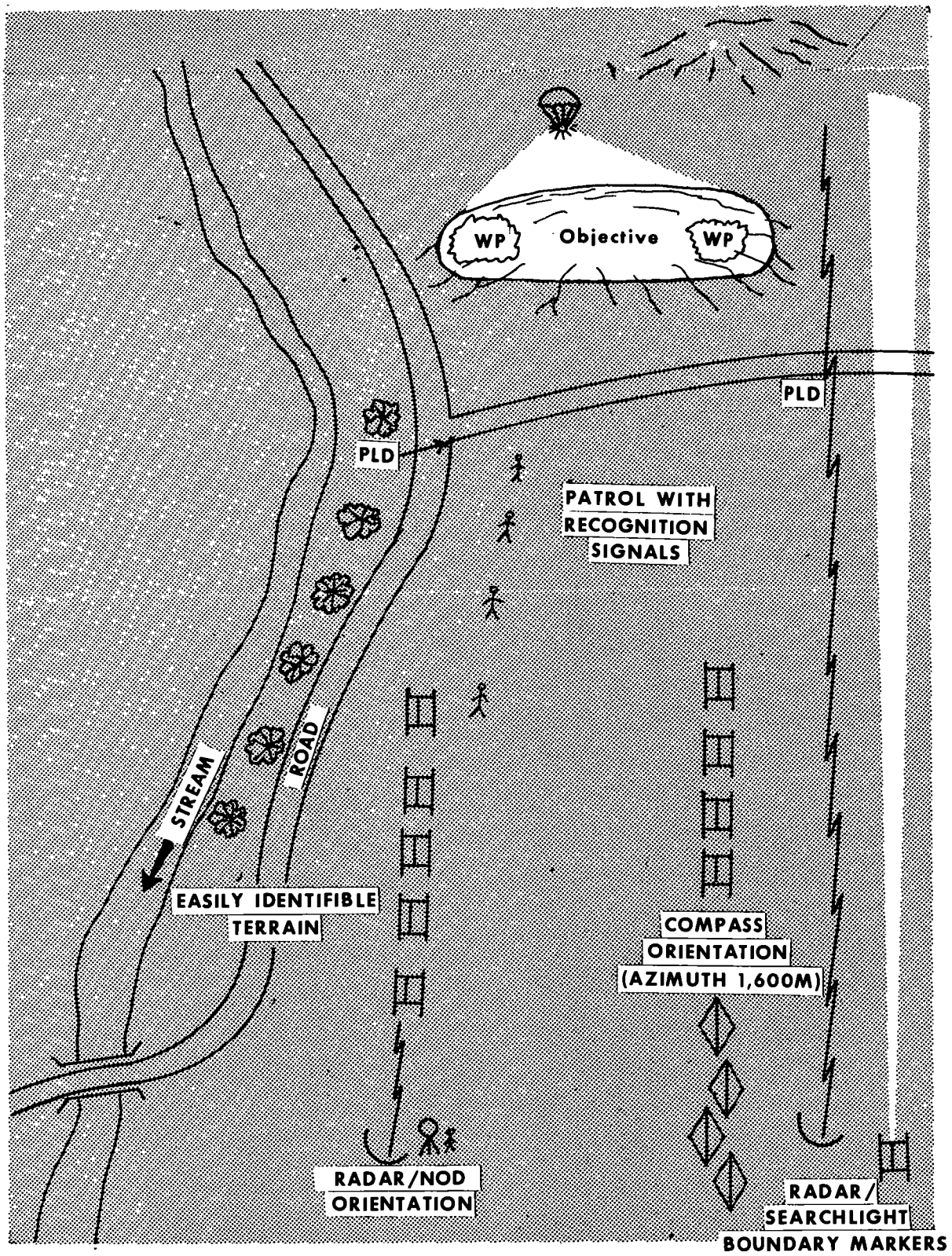


Figure 10–6. Means of orientation.

(7) *Compasses.* The compass can be used to provide units with the capability of maintaining *general direction.* For instance, the company commander, the forward observer (FO), and each platoon leader and platoon sergeant of a tank platoon are issued a compass. These personnel may be used as the base upon which the remaining elements of each unit guide. Compasses are also issued to mechanized rifle platoons to squad level. The technique for using the compass is as follows:

(*a*) The commander of a base tank APC determines the proper azimuth while dismounted and lines his vehicle up on the correct bearing. He then mounts his vehicle, insures that the engine is operating, and rechecks his azimuth to determine the deviation caused in the compass reading by the vehicle and running engine. By accounting for the deviation, the commander is then ready to move. Individual tank commanders must be aware that any subsequent movement of the main armament will result in an unreliable compass reading.

(*b*) To further aid orientation using this method, the compass should be checked shortly after movement is begun. In addition, readings from the vehicle odometer are used in conjunction with the azimuth to determine the distance traveled on a given bearing.

(*c*) If a major change in direction is required during movement, the above procedure must be repeated.

(8) *Easily identifiable terrain.* Prominent terrain features such as dominating hills, unusual terrain formations, trees, or man-made objects should be used in conjunction with the above for orientation. Care must be taken to insure that these features or objects are observed at least by platoon leaders during the hours of darkness to facilitate recognition at the time of the attack.

(9) *Night vision devices.*

(*a*) Crew served weapons night vision sights mounted on the cal .50 machineguns on the mechanized infantry armored personnel carriers are used in maintaining formation with other elements of the team and proper direction.

(*b*) Starlight scopes used in the hand-held mode are employed by mechanized platoon leaders and fire team leaders to assist in maintaining control and directed formation for both mounted and dismounted operations. In addition, starlight scopes permit surveillance of the area for enemy activity or targets on the move.

(10) *Bearings.* Radar and infrared detectors may be used by maneuvering elements for navigation by taking bearings from preestablished or known radar or infrared emitters.

10–15. Employment of Night Operating Aids During the Attack

a. General. The use of night operating aids to improve team capabilities during the planning and conduct of night attack provide improved solutions to the problems of identification, control, coordination, maintenance of direction, and the extension of aimed, direct fire.

b. Principles of Employment of Tank-Mounted Searchlights in the Attack. In using tank-mounted searchlights for direct illumination, the following principles are considered:

(1) Vehicles or troops advancing toward an enemy position should remain along the outside edge of the searchlight beam to use the diffused light along the edge of the beam.

(2) Detection by the enemy can be reduced by the following measures:

(*a*) If the enemy observer is some distance (1,500 meters) from the friendly light source, position the light so that the enemy observer is generally in the center of the beam; the friendly approaching elements should then remain on either side, outside the beam's edge.

(*b*) If the enemy observer is relatively close to the friendly light source (700 meters for visible light), then position the lightbeam so that he must look through or across it. The friendly approaching element should remain beyond the far edge of the beam, *away* from the enemy (fig. 10–7).

(3) Tank-mounted searchlights accompanying a force should not illuminate while moving because the resulting illumination is

not effective and the illumination will prematurely disclose the direction of attack. Illumination should be accomplished while tanks are temporarily stationary. This restriction will be reduced with the introduction of tanks equipped with stabilized turrets. Stabilization is available on some main battle tanks and the armored reconnaissance airborne assault vehicle.

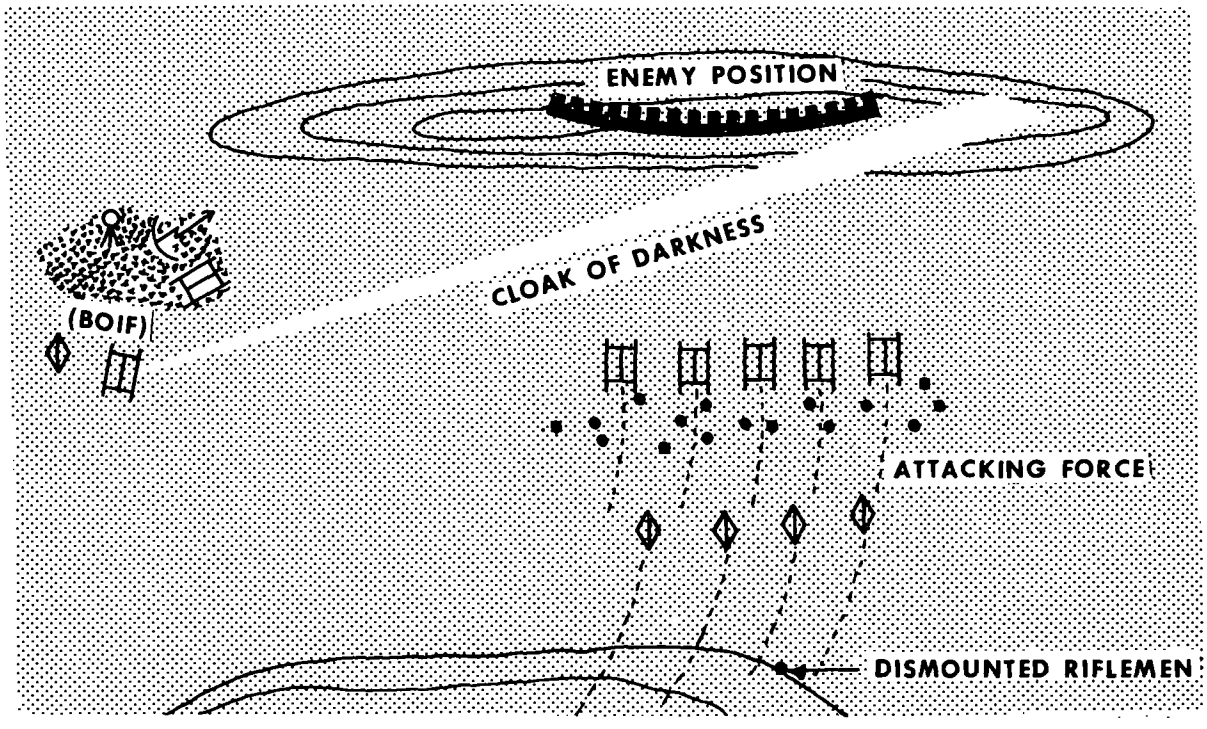


Figure 10–7. The cloak of darkness behind the vehicle searchlight beam.

c. The Role of Tank-Mounted Searchlights in the Attack. Tank-mounted searchlights are best employed in the following roles:

(1) In the initiation and the continuation of an exploitation.

(2) In a night attack against a hastily organized position.

(3) In a night pentration, as a part of the assault, to conceal the movement of accompanying tanks and infantry in the "Cloak of Darkness" between the lightbeam and the objective (fig. 10–7).

(4) In a night attack, as part of the BOIF, to illuminate the objective.

(5) In orientation of friendly troops once illumination has been initiated. This can be accomplished by illuminating a part of the objective, terrain features leading to the objective, or terrain features between the LD and the objective. The lightbeam itself may be used as a guideline, a boundary, or the PLD. (Friendly troops should avoid moving in the brightest part of the beam, but should skirt the edge of the beam to obtain maximum concealment.)

(6) Searchlight illumination using the pink filter adds materially to the available ambient light to enhance observation and extend the range of passive night vision devices when visible illumination is not desirable.

d. Methods of Employment of Tank-Mounted Searchlights. Illuminating tanks should be provided by an uncommitted force (part of BOIF). This concept of providing tank-mounted searchlight illumination insures that the attacking force does not dissipate its combat strength. Normally, one tank platoon is required to provide adequate illumination

for a team level attack. Once the illumination mission for the attack has been completed, the illuminating platoon reverts to parent unit control, since the attacking force can provide its own illumination, if required, from its own organic searchlights during consolidation. The following methods of employment may be used.

(1) *Illuminating tanks support by fire and illumination.* Tanks are dispersed 50–100 meters apart throughout the supporting position. This permits the best means of delivering fire and illumination on the target. The searchlight commander is located to provide maximum control of the lights and is integrated into the maneuver force command net so that illumination is responsive to the commander of the maneuvering force (fig. 10–8).

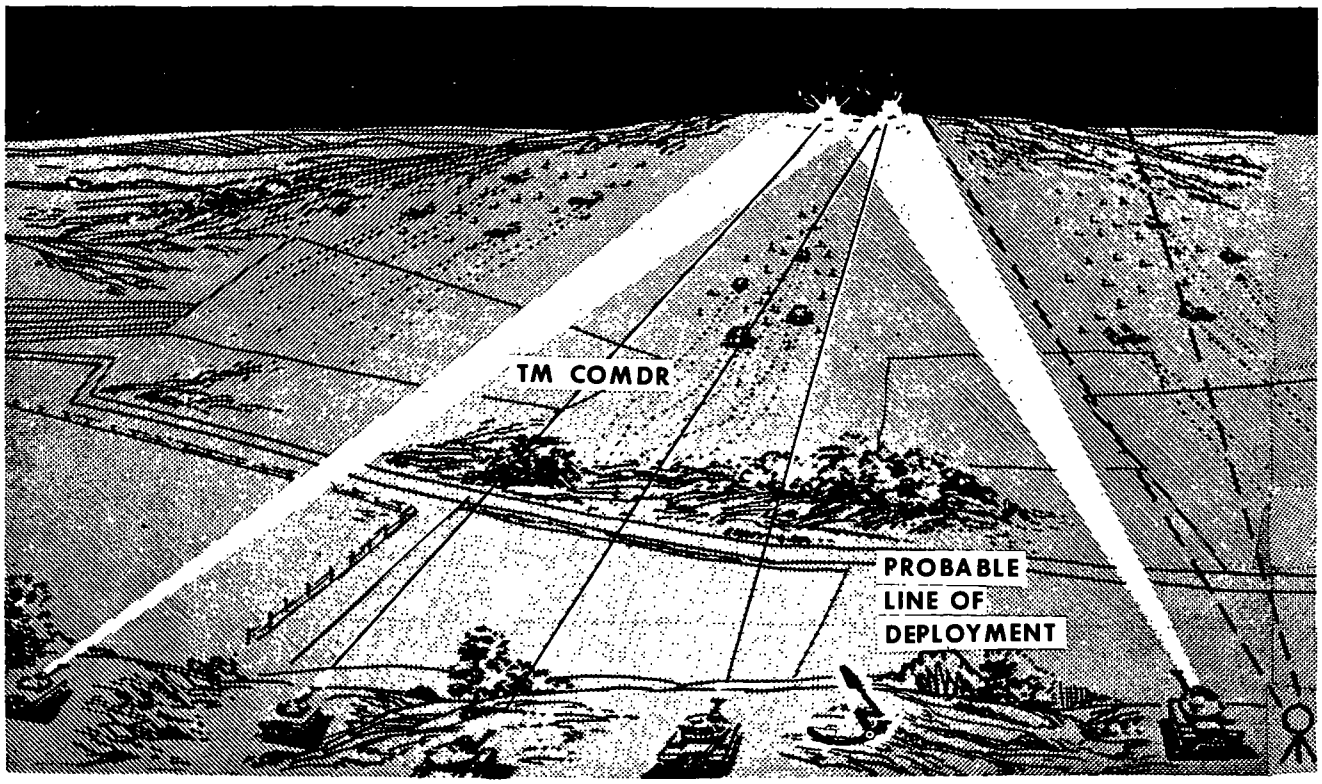


Figure 10–8. Use of radar, night observation devices, and tank searchlights (visible and infrared mode) in base of observation, illumination, and fire (BOIF).

(2) *Illuminating tanks incorporated into maneuver force.* This method is used for deep objectives or when the configuration of the terrain is such that the searchlight tanks cannot illuminate the objective from the FEBA. When tank searchlights are incorporated in the maneuvering force, the illumination unit moves with the forward echelon so it is readily available to illuminate for the attacking force. Care must be taken that the assaulting tanks are not silhouetted. When employed, the illuminating tank element uses flicker illumination with the illuminating tank unit commander controlling the illuminating tanks in response to the commands of the maneuver unit commander. Whenever possible, searchlight tanks approach to within 1,500 meters or less of the objective before illuminating (fig. 10–9).

(3) *Illuminating tanks provide boundary illumination.* Tank searchlights may be used to mark boundaries after illumination has

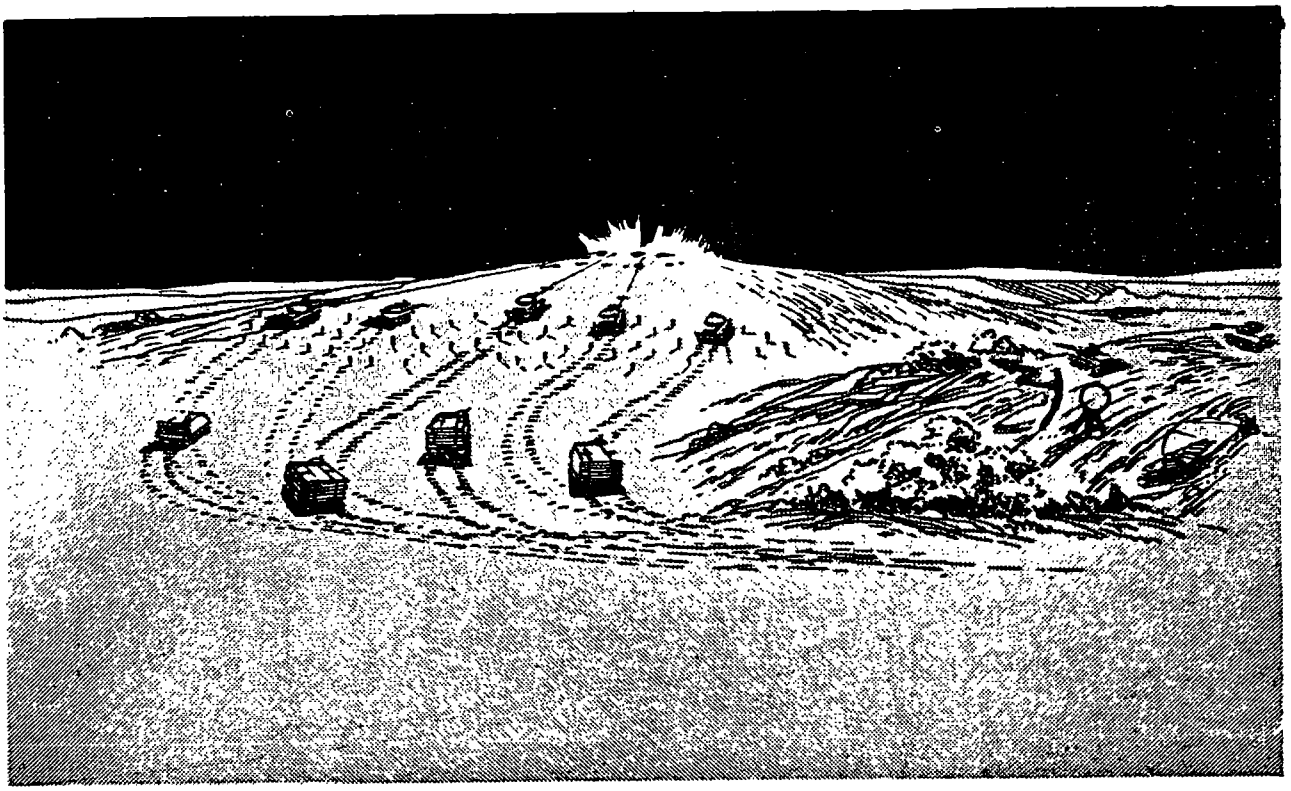


Figure 10–9. Use of searchlights and night operating aids when tanks and infantry are used in the maneuver force.

been initiated. When employed in this manner, they operate in pairs and use flicker illumination. The searchlight beam is layed on predetermined terrain features or on a given azimuth prior to illumination, if possible (fig. 10–10).

e. Employment of Infrared (IR) Illumination. Tanks equipped with the 23-inch Xenon searchlight are capable of providing IR illumination in addition to visible "white" light. Observation of this illumination requires the use of an IR receiver such as tank-mounted IR fire control equipment, metascopes, IR weapon sights, and M18 binoculars. IR illumination, while effective, has a significantly reduced range from the visible mode. Use of IR is particularly well suited for illumination immediately after occupation of the objective when visible light is undersirable.

f. Employment of Passive Night Vision System. Passive night vision equipment is used for surveillance or for fire control with individual, crew served, and armored vehicle weapons. This system should be integrated into the unit's surveillance, security, and fire plans. Passive and active night vision measures are used in a complementary role. Both systems are capable of independent use. Upon detection of a suspected target, it may be possible to identify and engage the target by using only passive vision devices. If identification is not possible, active night vision equipment may be employed to positively identify the suspected target. An example would be the passive use of a metascope or IR binocular to survey an area for IR emission. Upon detecting IR emissions, an attempt is made to identify the target, and to range and place fire on it by using the metascope in conjunction with the rangefinder. If unsuccessful due to a low light level, the searchlight may be used in the IR mode and if more illumination is necessary, in the visible mode. The control of active illumination equipment is vested in the commander having direct control of the operation.

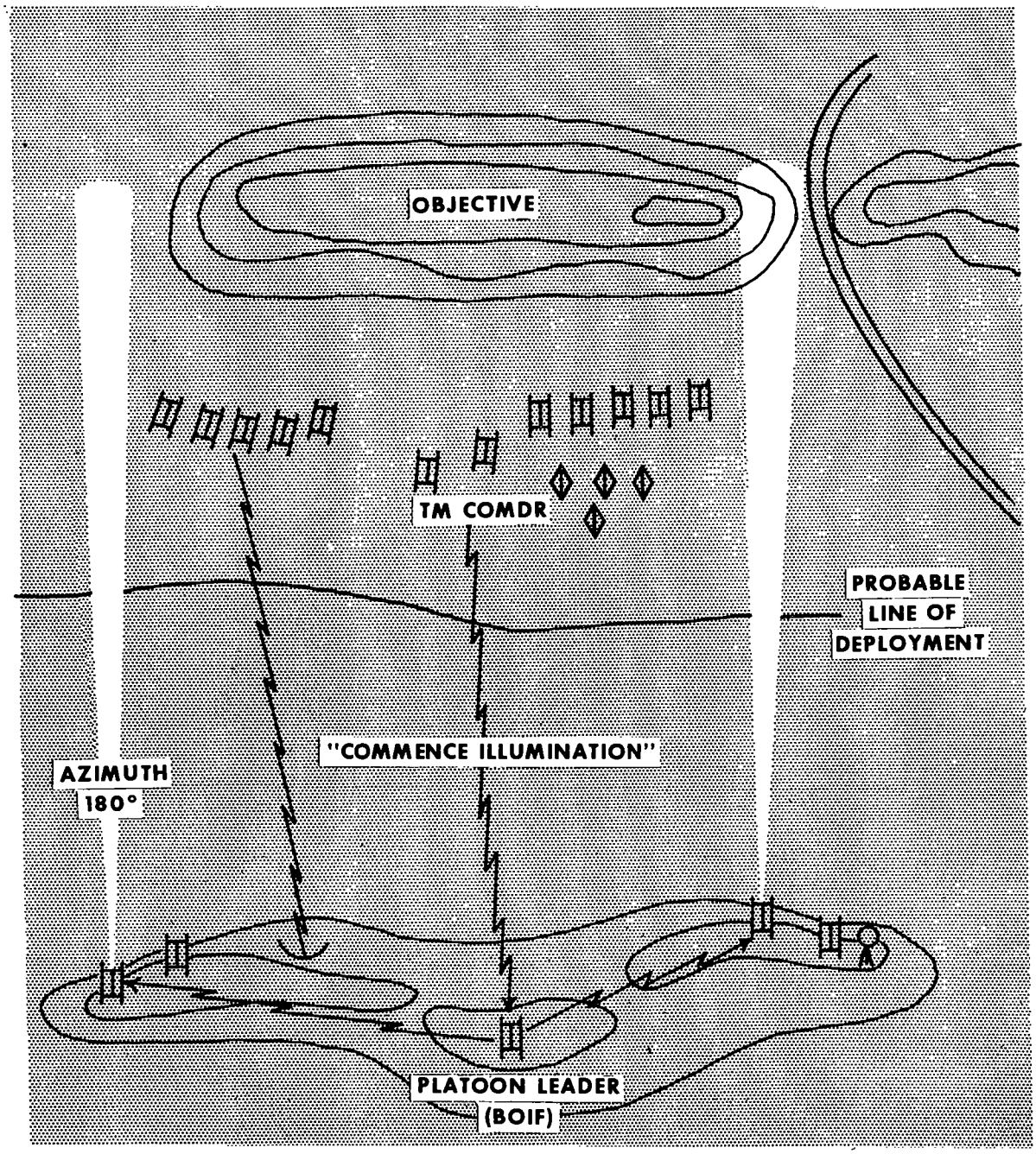


Figure 10–10. Searchlight tanks provide boundary illumination.

g. Countermeasures Against Visible and Invisible Lights.

(1) *Visible light.* The most effective countermeasure against visible illumination, other than destruction, is counterillumination. This reduces or sometimes nullifies the effectiveness of the initial illumination. Other measures are the use of smoke to diffuse the light, direct or indirect fires placed on the light source, and/or by an assault of the light source position by infiltrated infantry forces.

(2) *Invisible light (IR).* Invisible illumi-

nation of the battlefield must be detected before effective countermeasures may be taken. After the illumination device has been detected and the range of its location determined, the following courses of action may be taken:

(*a*) The device may be kept under observation for possible elimination later.

(*b*) The device may be fired on by direct or indirect weapons.

(*c*) Counterillumination may be used.

(*d*) Smoke may be used to diffuse the light.

(3) *Passive system countermeasures.* The use of passive surveillance systems may be countered by using the same techniques employed during daylight to prevent observation by the enemy except that sparse concealment is ineffective against some IR detectors. Movements or operations in areas under observation should be restricted.

h. Radar. Use of ground surveillance radars to augment vision devices should be planned whenever possible. The complementary capabilities of the radar (to detect objects at extended ranges) and of the night observation devices (NOD) (to identify the object when within range) reduce materially the problems of control and security along the flanks. Initial acquisition of targets by radar and measurement of azimuth and distance can be used to initiate surveillance by the NOD and to establish initial orientation prior to illumination. Radars, night observation devices, and searchlight tanks are used together whenever possible, as the principal elements of the BOIF. (Use of tanks in the BOIF is contingent on requirements for tanks in the maneuver element.)

10–16. Conduct of the Attack

The conduct of the attack by the company team is executed as discussed in paragraph 10–9.

10–17. Actions on the Objective

a. Consolidation. Immediately after occupation of the objective, physical contact should be made at contact points located between objectives to facilitate coordination and insure control of gaps between units. Forward security is established as soon as possible. Interim use of IR should be considered until listening and observation posts are established. Under normal circumstances OP's and LP's should not be located beyond the limit of advance. If these security elements are required to go beyond this limit, their positions are accurately plotted, fire plans adjusted, and continuous communication maintained. Dismounted mechanized infantry squads use starlight scopes to aid observation, detection, and identification while engaged in OP/LP and forward security missions.

b. Reorganization. Reorganization procedures are essentially the same as daylight procedures. In addition, during reorganization planning is conducted to exploit the advantages gained during the attack and to continue the advance on order. Continued planning for a night defense is accomplished concurrently (ch 14).

10–18. Exploitation

With the distribution of more effective passive night operating aids and illumination means to unit level, it is possible to conduct an exploitation at night. Against a strong but shallow defense, consideration should be given to attacking two successive objectives in order to effect a penetration of several thousand meters in depth and then enter the exploitation phase in column formation. The controlling maxim is surprise, speed, and retention of the initiative. The attack should be pushed, making maximum use of active and passive devices until encountering significant opposition, at which time, visible illumination is employed. Infrared illumination may be used advantageously in many situations. This is particularly true in built-up areas.

Section IV. PLATOON IN THE NIGHT ATTACK

10-19. General

This section discusses specific considerations for the platoon in a night attack. Information contained in this section must be used in conjunction with the other material in this chapter.

10-20. Basic Considerations

a. Effective Leadership. In the night attack platoon leaders, tank commanders, and squad leaders must be capable and ready to take independent and aggressive action. Control by the team commander is difficult to achieve during the conduct of the attack.

b. Thorough Daylight Reconnaissance. Reconnaissance is essential to the lowest possible level. For a detailed discussion of reconnaissance requirements and techniques, see paragraph 10-13.

c. Detailed Simple Plans. Plans that are simple and complete in detail improve chances of success. In brief, maximum use is made of terrain features, night operating aids, and coordinating measures in disposing the platoon before the attack as well as in guiding them during the attack.

10-21. Planning

In addition to the considerations contained in paragraphs 10-5 and 10-14 the following factors are particularly applicable to platoon operations.

a. Identification.

(1) *Personnel.* Leaders in the maneuver force may wear white or luminous tape on the back of their helmets; as an example, vertical for officers and horizontal for noncommissioned officers. Tank commanders or rifle squad leaders may wear white covers on their forearms to control mounted (or dismounted) formations during listening silence. Guides may wear luminous or white armbands and, as an extra precaution, should have either the IR light from the metascope or a filtered light signal for recognition purposes (different color or number or combination for each platoon). An expedient filter can be made by coloring the flashlight lens with a grease pencil. These identification devices permit location of key personnel rapidly using either passive or active detectors.

(2) *Vehicles.* Tanks and armored personnel carriers can be marked in the rear with panel markers, strips of luminous tape (different number of strips for each platoon), or by filtered colored lights (different color for each platoon).

(3) *Dissemination.* Whatever system is used, it must be standardized and widely disseminated to all personnel in sufficient time for preparations.

b. Illumination, Tank-Mounted Searchlights. The teachnique used to offset enemy counterillumination measures is called *flicker* illumination. The search lights are operated in groups of two or more when using flicker techniques, and they are widely dispersed throughout the forward edge of the battle area, attacking force, or defensive sector. The duration of each flicker should be approximately 5 to 15 seconds. During the period one searchlight, is flicked off, other searchlights should be flicked on so that constant illumination is provided in the target area from multiple and varying sources. Flicker illumination of less than 15 seconds duration requires a preplanned sequence of illumination and engagements by specific tanks. As an example, tank 2 is designated to engage the first target illuminated. The sequence of illumination is tank No. 5,1,4, and 3. This sequence should be repeated twice followed by displacement of all tanks to a new position. Subsequent targets illuminated are engaged by other predesignated tanks (i.e., 2, 5, 1, 4, and 3). Flicker illumination of less than 15 seconds should be restricted to Xenon searchlight-equipped tanks. Many targets will require more than one light to illuminate the target area. Counterillumination measures taken against enemy searchlights are accomplished by—

(1) Immediately directing an intense friendly searchlight beam at the enemy searchlight (both white and IR mode).

(2) Directing HE and smoke (artillery or mortar) against the searchlight position

after estimating the position to the searchlight from multiple positions outside the beam; by inspection of the map for possible searchlight positions, and by a knowledge of the enemy's lighting capabilities (fig. 10–11).

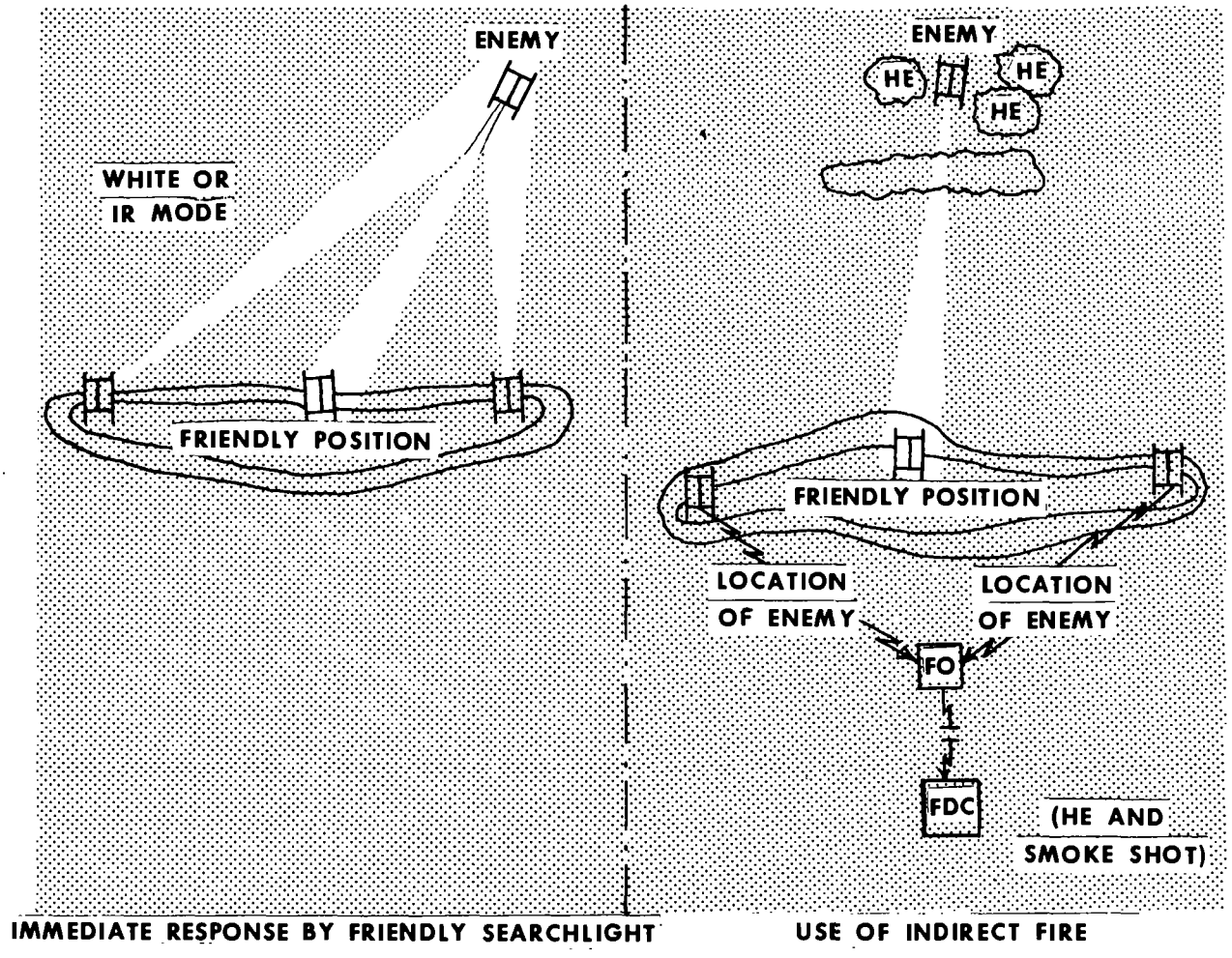


Figure 10–11. Counterillumination against enemy tank-mounted searchlights.

(3) Once illumination has been called for, the tank commanders of the illuminating tanks must carefully avoid silhouetting the friendly assaulting elements. Flicker illumination techniques are employed with each searchlight laid as accurately as possible on its target area before illumination so that when illumination is initiated, the light achieves immediate maximum illumination and psychological effect without loss of surprise. During flicker illumination, those tanks that have extinguished their lights search out and engage enemy point targets illuminated by the other tanks.

c. Occupation of Illuminating Positions.

(1) Positions selected for illumination by tank-mounted searchlights in the BOIF must be selected with the prime consideration of being able to illuminate the desired target or area. Secondary considerations include the selection of high ground if possible, defilade positions, and good routes into and out of the selected position. Alternate positions must be selected using the same criteria and periodic-

ally occupied during the illuminating mission to prevent effective enemy counterillumination of fires.

(2) When illumination is being provided by the maneuver element, selection of subsequent positions should be accomplished prior to movement. Those crewmen not engaged in illumination or firing are designated to observe and select subsequent and alternate positions.

10–22. Conduct of Night Attack

Detailed discussions of conduct of the attack are located in paragraphs 10–9 and 10–16.

10–23. Action on the Objective

See paragraphs 10–10 and 10–17 for details on actions on the objective.

10–24. Exploitation and Pursuit

See paragraphs 10–11 and 10–18 for the discussion of exploitation and pursuit.

CHAPTER 11

ARMORED CAVALRY UNITS IN THE NIGHT ATTACK

Section I. GENERAL

11-1. General

Armored cavalry units engage in attacks in an economy of force role. They engage in attacks most frequently to accomplish assigned reconnaissance, surveillance, or security missions. Attacks by these units may be a series of individual platoon or troop night actions, or a squadron may conduct a coordinated night attack.

11-2. Armored Cavalry Unit Missions

Armored cavalry missions are generally reconnaissance or security missions such as movements to contact, flank guard, rear guard, covering force, or screening force. See FM 17-36 for detailed definitions and discussions.

Section II. ARMORED CAVALRY SQUADRON IN THE NIGHT ATTACK

11-3. General

This section discusses specific considerations for the armored cavalry in the night attack. Because of the similarity of organization for combat of an armored cavalry squadron in the attack to a tank-mechanized infantry task force in the attack, the discussion in chapter 10 is applicable with minor modifications.

11-4. Distribution of Forces for Night Attack

The squadron is normally divided into a maneuvering force and a base of illumination and fire (BOIF). If sufficient forces are available after the requirements of the maneuvering force and BOIF are met, a reserve may be designated (figs. 11-1 and 11-2).

11-5. Maneuvering Force

a. The maneuvering force consists primarily of tanks and rifle elements. The squadron commander insures that the squadron maneuvering force has sufficient tank and rifle strength to provide the combat power to accomplish the mission. Normally, this allocation of resources is achieved through task organization within each troop (fig. 11-3).

b. For a detailed discussion of the conduct of night attacks see paragraphs 11-11 through 11-32 and chapter 10.

c. Air cavalry elements maintain surveillance of the area of operation. Reconnaissance from aircraft at night is limited and maximum use is made of all available active and passive night vision aids. A detailed discussion of employment of the air cavalry troop in a night attack is contained in paragraphs 11-11 through 11-17.

d. Ground surveillance radars and medium range night observation devices (NOD) are employed to assist in providing flank security and to search beyond the line of contact. Terrain permitting, these devices are collocated in a position well forward to allow searching the objective before and during the night attack to detect any movement by the enemy that might indicate reinforcement or change of disposition. Flank security is provided by these devices with the radars detecting enemy movement and the NOD providing target identification. During the reorganization, the radar and NOD are used to assist in local security to prevent a surprise counterattack.

11-6. Base of Observation, Illumination, and Fire (BOIF)

In a squadron attack the BOIF is usually provided by organic support squads, aero scouts

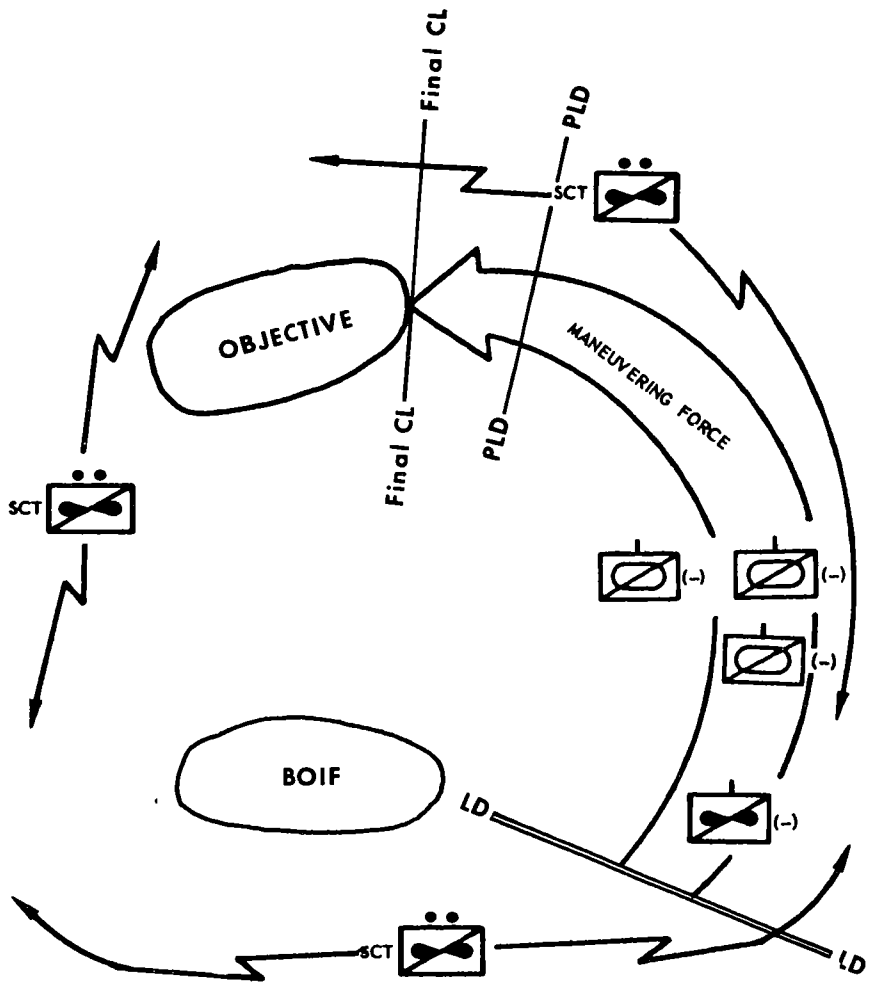


Figure 11–1. Distribution of forces, armored cavalry squadron in the night attack (method 1).

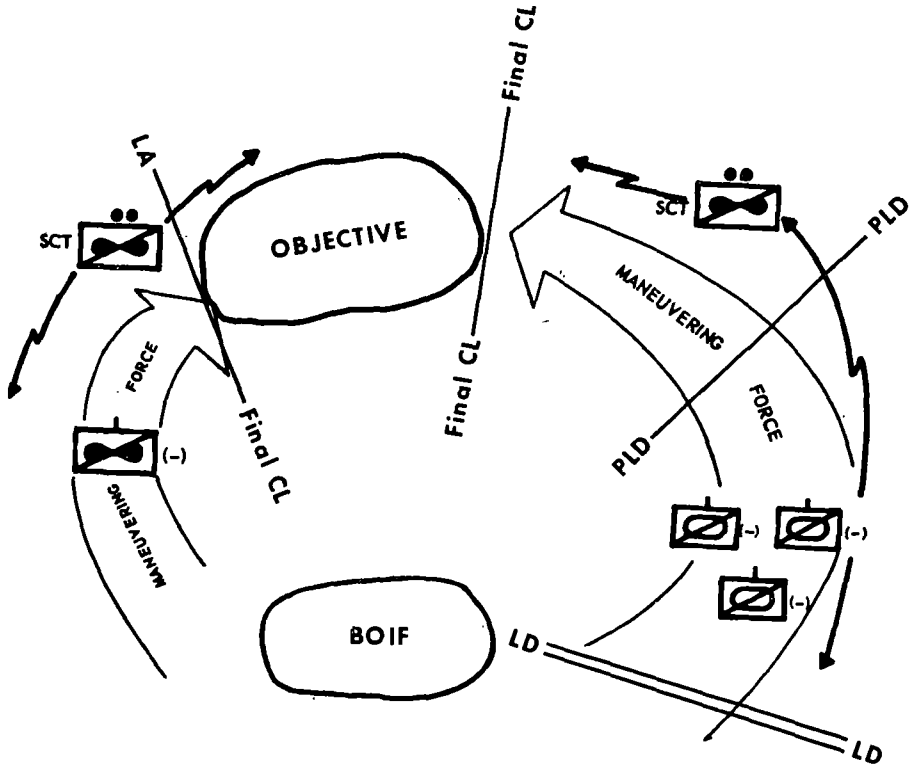
and aero weapons of the air cavalry troop, and automatic ground weapons. The BOIF may be supported in this mission by artillery, tactical air, and naval gunfire. Tanks are placed in the BOIF if terrain does not permit their effective employment with the maneuvering force, or if a requirement exists for direct searchlight illumination that cannot be provided by other sources. Air cavalry elements are employed to augment the BOIF, particularly against the flank and rear of the objective.

11–7. Planning the Night Attack

The plan for a night attack must stress simplicity. For a detailed discussion of basic considerations see chapter 10.

11–8. Conduct of the Night Attack

Once the squadron attack is launched, it is executed with aggressiveness and violence, using all available firepower. Under the cover provided by darkness and the BOIF, the maneuvering force closes rapidly with the enemy. From the moment the discovery of the attacking force is indicated by enemy illumination, or when effective fires are received, friendly illumination is initiated. Thereafter, movement to the objective is as rapid as terrain permits. When the assault is launched, fire is delivered continuously so that when supporting fires are shifted or lifted, the enemy is exposed to constantly increasing intensity of fires until he is destroyed or captured.



NOTE: AIR CAVALRY TROOP FINAL CL IS ALSO THE LA FOR THE AIR CAVALRY TROOP

Figure 11-2. Distribution of forces, armored cavalry squadron in the night attack (method 2).

11-9. Actions on the Objective

Consolidation and reorganization on the objective are basically the same for an armored cavalry squadron as they are for a tank-mechanized task force. For details, see chapter 10.

11-10. Exploitation and Pursuit

a. Exploitation is a phase of the night attack that usually follows a successful penetration, envelopment, or turning movement. During an exploitation by the division, the armored cavalry squadron normally will be employed on security missions and conducts night attacks in order to accomplish the assigned mission. It generally operates to the most dangerous flank and parallels the movement of the protected force.

b. Pursuit is a phase of the exploitation that has as the primary purpose the capture or destruction of retreating enemy forces. Although pursuit objectives are enemy forces, the pursuit at night must use terrain objectives as control measures. The squadron may be employed as an advance covering force to regain contact with the enemy or to protect the flank or rear of the division.

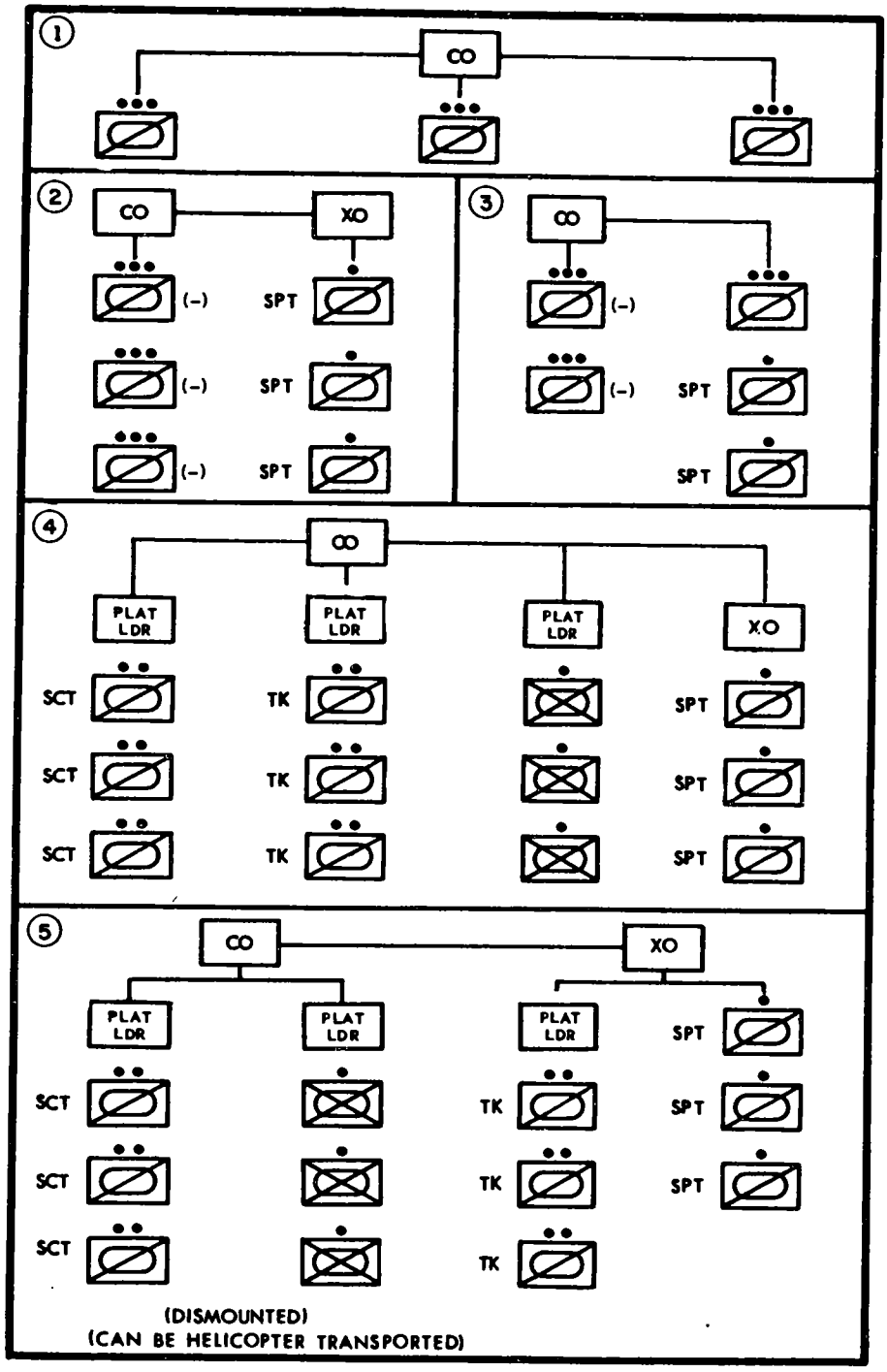


Figure 11–3. Five methods of organizing the armored cavalry troop for combat.

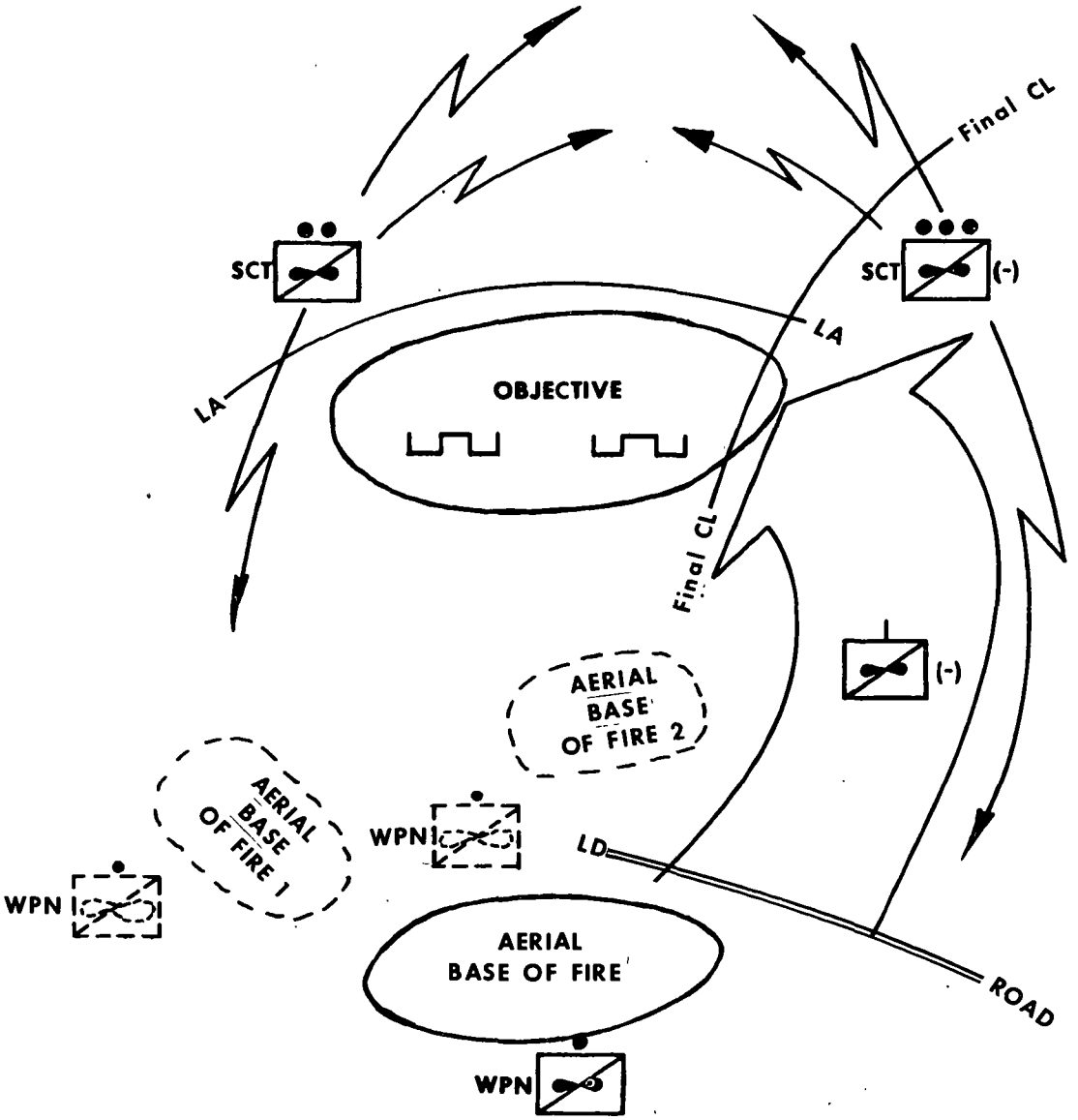
Section III. AIR CAVALRY TROOP IN THE NIGHT ATTACK

11–11. General

a. The air cavalry troop normally attacks in conjunction with other elements of the squadron to accomplish assigned reconnaissance, surveillance, and security missions. The troop may attack when the mission requires

the destruction of enemy encountered, when it is necessary to reduce an enemy position to continue the mission, or when the mission is to seize a particular objective. It may attack with or without reinforcements, when used on an independent mission.

b. Normally, the troop engages in night attack action as a unit. The aero scout platoon may be employed as an aerial base of fire. The aero rifle platoon normally is employed dismounted as the maneuvering force to close with and destroy the enemy. However, to be successful, this mission must be within the offensive capabilities of a dismounted rifle platoon (fig. 11–4).



NOTE: LA IS APPLICABLE TO ASSAULT ELEMENTS; FIRES FORWARD OF LA MUST BE COORDINATED WITH AERO SCOUT PLATOON SCREEN PRIOR TO FIRING.

Figure 11–4. Air cavalry troop in a coordinated night attack.

c. The cavalry troop is not normally used in a planned offensive role or as an attacking force to seize an objective at night. The organization and equipment of the troop are of such a nature that the unit should not be unnecessarily exposed to loss. It capabilities for sustained night offensive action are limited. The inherent limitation imposed by night operations are largely overcome by detailed planning and well trained and disciplined troops (para 4–28 through 4–38).

11–12. Planning the Night Attack

a. The commander's preparation for the attack consists of issuing a warning order, beginning an estimate of the situation, coordinating with other units, making a tentative plan, making a personal reconnaissance, completing the plan, and issuing his oral order.

b. In organizing for combat, the air cavalry troop may use its elements as organized. It may also cross attack elements with each other to form platoon teams. After receipt of the order in which the troop commander announces the team composition, the leaders to which elements are attached coordinate their actions. At this time they make all necessary arrangements concerning communications, liaison, reconnaissance, and other matters of mutual interest.

c. Coordination with other units is accomplished during the reconnaissance. If the attack is to be made in conjunction with friendly units, the troop commander or his representative coordinates with the commanders of those units and accomplishes essential coordination. This coordination includes establishing the location of leading elements; arranging recognition signals; planning supporting fires, to include artillery and mortar illumination; and determining fire control measures. Link up by ground troops is coordinated if required for the operation. This is often the case in limited objective offensive operations since the air cavalry troop is not organized for sustained defense of seized objectives.

d. All individuals of the troop must receive the order in sufficient detail to insure understanding and proper execution of the night attack.

e. Before the troop is committed to a night attack, the commander normally makes a personal air reconnaissance. This is conducted in both daylight and darkness, if possible. He arranges to have his subordinate leaders accompany him or to come forward to meet him at a specified time and place. After the commander issues his attack order, the subordinate leaders make as detailed a reconnaissance as time permits. Caution is used in the reconnaissance not to give away the intentions of the unit.

f. The plan of the night attack is designed to insure maximum coordination within the attacking forces throughout the operation. The night attack plan must be simple but must cover all essential details. It should include the location(s) and compositions of the aerial base of fire, targets to be fired upon, and signals for lifting or shifting the fires of the base of fire and supporting illumination. It should include the composition of the maneuvering force, the avenue of approach, control measures, the formation to be used, and, if required, its method of advance. It should include provisions for security during the attack, for consolidation on the objective, for reorganization after the attack, and for resumption of the advance (fig. 11–5). Organic fire support is normally provided by the aero scout platoon. Artillery or mortar support from ground units is also used if the objective is within supporting distance. When supporting fires are provided, coordination is required to insure that helicopters avoid trajectories of all fires. Illumination is normally provided by mortars and artillery. This illumination may be augmented by tank searchlights from the armored cavalry units on the ground and aircraft equipped with illuminating lights or flares, if available.

11–13. Aero Scout Platoon

a. Reconnaissance operations are less effective at night. Night reconnaissance in support of the night attack is generally limited to reconnaissance of the area of operation to detect the enemy movement, positions, and reinforcements.

b. In conducting a night reconnaissance mission the aero scout squad makes maximum

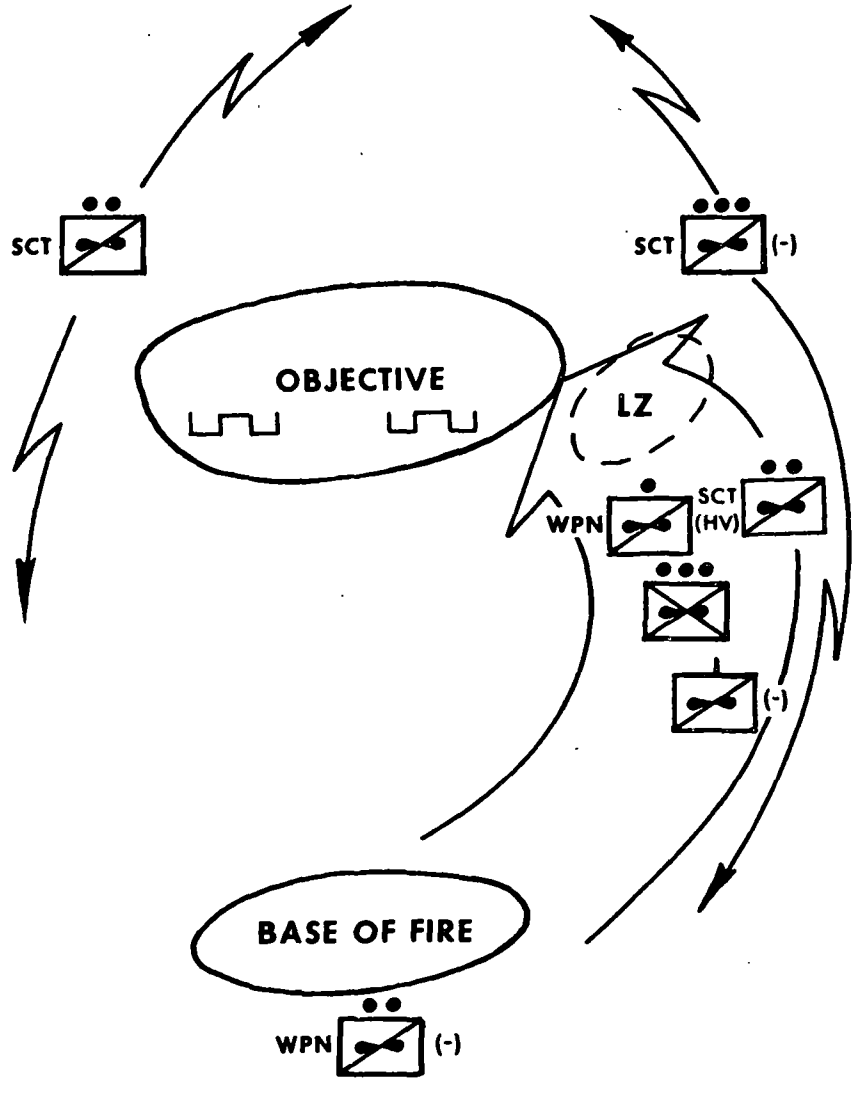


Figure 11–5. Distribution of forces, air cavalry troop in night attack.

use of night vision aids. Detailed planning and coordination of illumination over specific areas of interest or on the objective are accomplished prior to night reconnaissance operations. Squads position themselves where they can best observe and fire without being illuminated themselves (fig. 11–6).

11–14. Aero Rifle Platoon

a. Assault operations at night require detailed planning. Daylight air reconnaissance is made of the intended landing zone (LZ) when possible. Planning should include the formation in which aircraft will approach the LZ, lights to be used, illumination support, reference points for locating the LZ, and planned methods of extracting the dismounted elements. Normally, an LZ is selected that is larger than one for daylight operations. Maximum use of deception in LZ approach is planned and executed.

b. When dismounted, the platoon uses all available night vision aids to equip patrols, listening posts, observation posts, and for control when moving as a unit (fig. 11–7). Every effort is made to attack from the flanks or the rear of the objective. For details of conduct

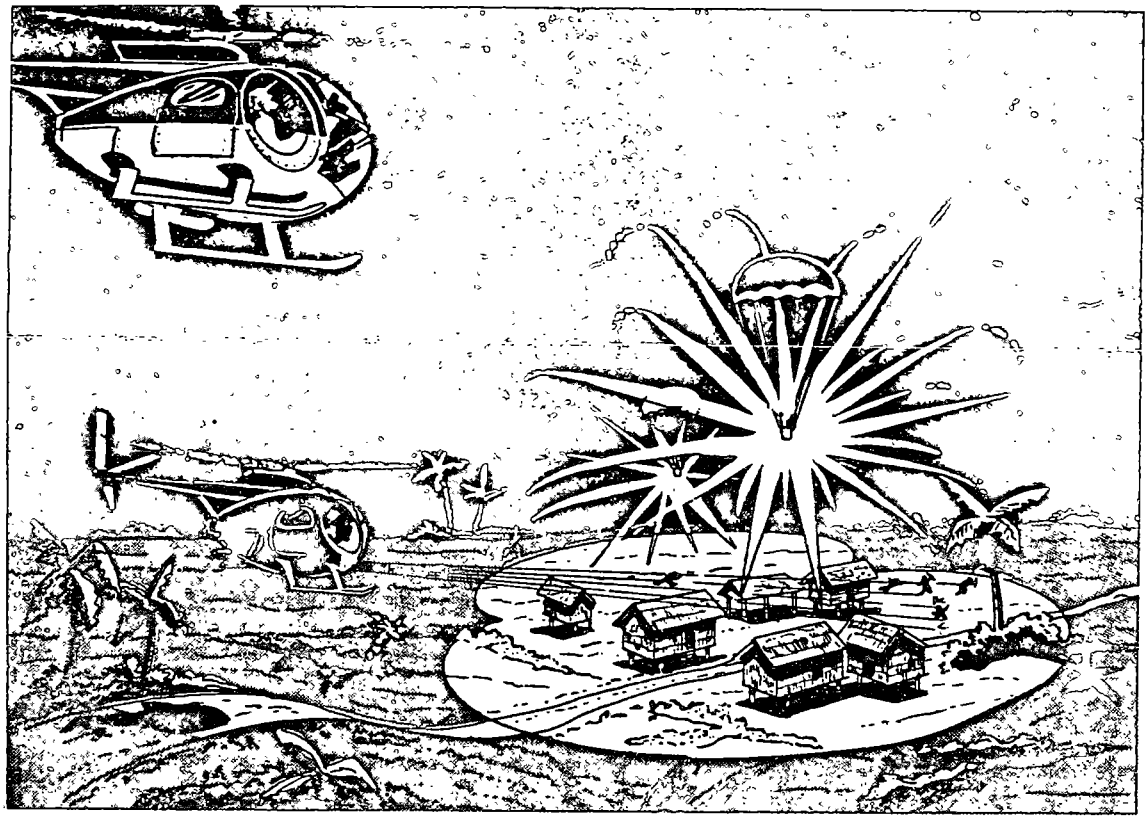


Figure 11–6. Night illumination, observation, and firing by flare.

of the ground attack at night, see paragraphs 7–16 through 7–19.

11–15. Aero Weapon Section

When operating in support of the aero rifle platoon in the night attack, the aero weapons section provides close fire support during the assault, attack, consolidation and reorganization following the attack, and during the extraction of the platoon from the pickup zone (PZ). The aero weapons section leader coordinates with the aero rifle platoon and the illuminating element to insure that adequate illumination and the heaviest volume of fire is available during the assault phase of the dismounted attack. The aero weapons section aircraft continue to deliver harassing fires on the enemy during the consolidation and reorganization on the objective.

11–16. Conduct of Night Attack

a. Unless otherwise planned, fire and movement begin immediately with the first definite hostile contact. The troop commander places himself where he can best control those elements of the troop that are making the main effort in the attack. He maintains communication with the other elements. Radio is the primary means of communication, but supplemental control means should be provided such as light or pyrotechnic signals.

b. The mission of the aerial base of fire element is to force the enemy to seek cover, neutralize his weapons, and soften him up for assault by the maneuvering force. The aerial base of fire may contain all or parts of the aero weapons section and aero scout platoon. Elements of the aero rifle platoon, however, are

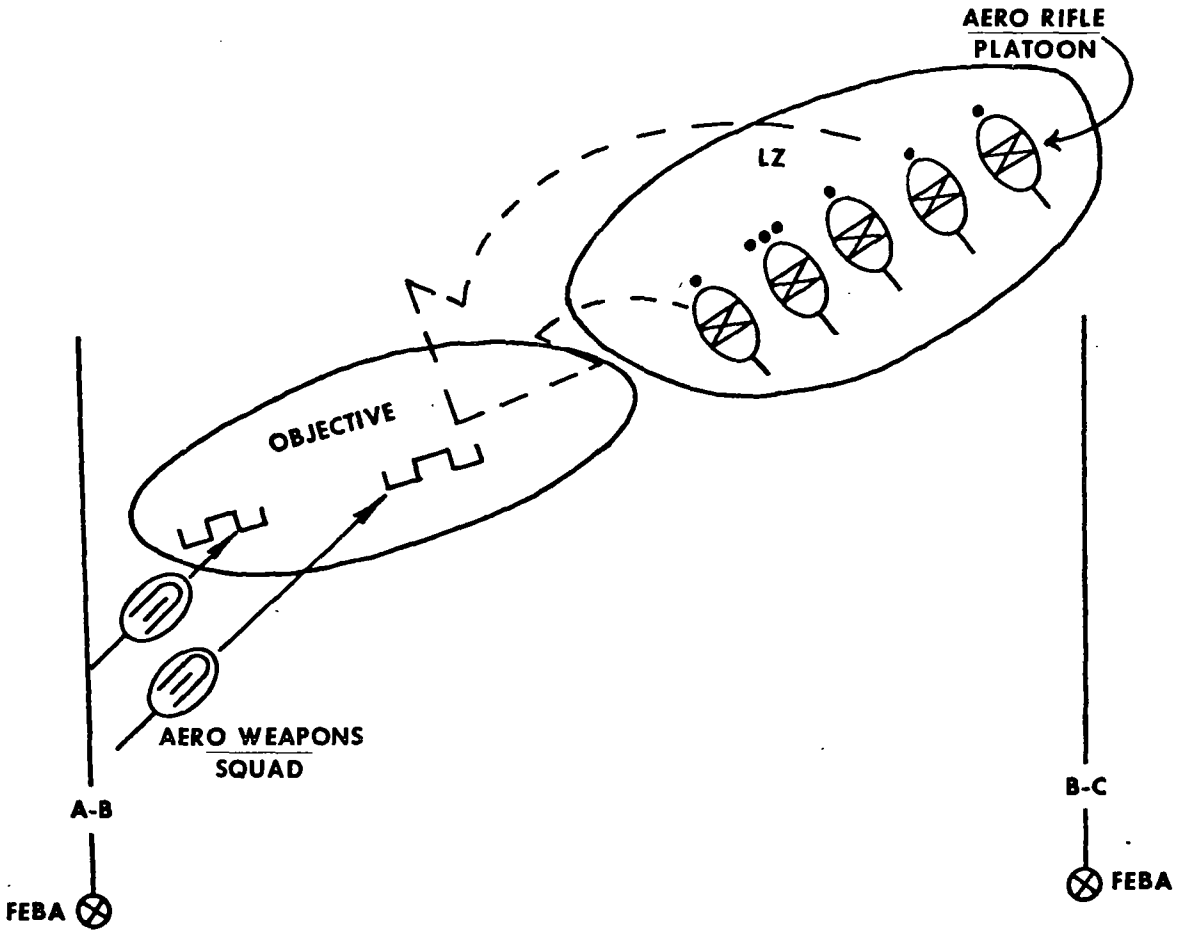


Figure 11-7. Aero rifle platoon landing and assaulting from flanks or rear of objective.

not normally used in this role. Aero scout elements may assist in directing the airbase of fire by use of night operating aids and field expedient illuminants to mark friendly positions. They have the advantage of being able to move rapidly in and out of position over terrain that would be difficult or impossible for ground units to use. When used to assist the airbase of fire, aero scout elements may locate and mark by fire, or adjust mortar and artillery illumination on the targets for the aero weapons section. Tactical close air support is employed, when available, to seal off the objective.

c. On a prearranged order, illumination is initiated and all aerial base of fire weapons begin to fire on the objective. The fire is distributed over the entire objective. As the aero rifle platoon arrives at the objective or masks supporting fires, the aerial base of fire lifts or shifts its fire beyond or to the flanks of the objective. Elements of the aero scout platoon or aero weapons section seal off the objective with suppressive fire, protecting the flanks and rear of the ground assault force and firing on targets of opportunity beyond the capability of the aero rifle platoon. This is controlled by radio communications or prearranged pyrotechnic signals. Helicopters in the base of fire may shift from one position to another whenever necessary to obtain better fields of fire or to escape enemy fire. Illumination of the objective continues as long as necessary to secure the objective. As soon as consolidation starts, illumination is suspended and observation using night operating aids is

initiated to maintain surveillance both in the air and on the ground.

11–17. Actions on the Objective

The troop reorganizes after the attack either to continue the advance or to defend or dominate the position taken. Security to the front, flanks, and rear is immediately established. Aero scout elements provide security at greater distances than the ground elements. Maximum use is made of passive night vision devices. This security includes maintaining visual contact with any enemy forces that may have been driven from the objective if light conditions permit. Casualties are provided emergency evacuation by medical or lift helicopters as required. Key individuals, who are wounded and evacuated, are replaced by other personnel. Ammunition is redistributed and helicopter armament systems are checked and reloaded. Prisoners of war are handled according to unit SOP. The commander makes his report on the action as soon as possible after the objective has been taken. The report includes the results of the attack, casualties sustained, prisoners taken, equipment losses incurred, immediate and future combat service support requirements, and plans for future action.

Section IV. ARMORED CAVALRY TROOP IN THE NIGHT ATTACK

11–18. General

This section discusses applicable doctrine and techniques in the conduct of a night attack by an armored cavalry troop. The information contained in this section must be used in conjunction with other sections of this chapter and chapter 10.

11–19. Basic Considerations

The basic considerations in preparation for a day attack apply equally to the night attack. In addition, specific considerations for a night attack include—

a. The commander makes a map reconnaissance and then a personal ground or air reconnaissance of the area of operations. If time or the situation does not permit a personal reconnaissance, the commander must rely on a detailed may reconnaissance in planning the attack.

b. The troop commander arranges to have the platoon leaders and supporting unit commanders accompany him or come forward to meet him at a specified time and place. Reconnaissance is extended to the lowest level consistent with time available. The troop commander normally completes his own reconnaissance before meeting with his platoon leaders. If available, an artillery forward observer accompanies the troop commander on the reconnaissance and assists in planning the use of supporting fires.

c. During his reconnaissance, the troop commander determines—

(1) Positions for supporting weapons in the troop BOIF. Consideration of the illumination requirement is of prime importance when selecting these positions.

(2) The avenue of approach to the objective for the maneuvering force.

(3) When necessary, positions for tanks employed in a support role. Specific considerations include—

(*a*) Location of searchlight tank positions if direct illumination is required.

(*b*) Capabilities and limitations of the missile firing tank.

(4) Location of obstacles likely to hinder the advance.

(5) Location of an attack position when required.

(6) Control measures.

(7) Location of line of departure.

(8) Locations of ground surveillance and night operating aids for use in control and security of the attacking force.

d. Elements of the air cavalry troop, when available, are employed to develop the situation and to determine the flanks of, and weak points in, enemy defensive positions. Care is taken to insure that these actions do not necessarily disclose the intent or plan of the troop. If possible, reconnaissance is started during daylight hours and continues into the hours of darkness.

e. Army aircraft are used by the troop commander in his reconnaissance. This simplifies, expedites, supplements, and improves the reconnaissance and information acquired through ground reconnaissance.

f. The troop commander allows time for platoon leaders to make a ground reconnaissance of the area of operations following issuance of the troop order for the attack.

11–20. Planning the Night Attack

a. Simplicity in planning night attacks is essential. Complicated maneuvers are avoided, and maximum control is delegated to subordinate element commanders.

b. The troop plan of night attack consists of two basic parts—the scheme of maneuver, and the plan of fire support (fig. 11–8).

(1) The scheme of maneuver includes the composition of the maneuvering force, the approach route to the objective, the method of advance, special control measures, limits of advance (LA), and considerations for exploitation.

(2) The plan of fire support includes the location and composition of the BOIF, targets to be fired on, and signals for lifting or shifting the fires. Responsibility for illumination and observation are established and positions are selected in accordance with the night visibility plan (NVP).

c. The plan of attack includes provisions for security during the attack, for consolidation of the position, for reorganization after the attack, and for resumption of the advance, if appropriate.

11–21. Maneuvering Force

a. The troop may comprise all or part of the maneuvering force during an attack conducted by a larger unit. When executing an independent attack, the troop provides the elements for both the maneuvering force and the BOIF.

b. When possible, tanks and mounted rifle squads are employed in the maneuvering force as tank-infantry forces.

c. Scout elements usually accompany the maneuvering force to provide flank security and to assist in the movement of the force. In extreme situations, scout elements mounted in armored vehicles may also join other elements in closing with the enemy; however, this type scout employment should be used only after consideration of alternative resources available. The primary consideration prior to employing scout vehicles in the assault is to weigh the combat advantage to be gained by their use, against the degraded capability to perform more normal scout roles such as a flank screen for the maneuvering force.

d. If the terrain or obstacles prohibit the use of vehicles, the maneuvering force consists of dismounted rifle squads and possible personnel from the scout sections. When scouts are so employed, they are formed as dismounted rifle squads.

e. The troop commander may employ one of several combinations of the platoon elements to constitute the maneuvering force when executing an independent night attack—

(1) Three tank-infantry forces each consisting of three tanks and one rifle squad.

(2) Two provisional tank platoons, one with five tanks, the other with four.

(3) A provisional rifle platoon of three rifle squads.

f. Provisional groupings of tanks, rifle, and scout elements are commanded by the platoon leaders, other key persons designated by the troop commander, or as prescribed in the unit SOP.

11–22. Base of Observation Illumination and Fire (BOIF)

The base of fire for the armed cavalry troop during an attack may consist of supporting artillery, air cavalry units, and tactical air, in addition to organic firepower. The nucleus of the organic BOIF for the troop is provided by the three mortars. They are grouped under troop control whenever they can effectively support the troop attack. Scout elements, if necessary, are used to assist the base of fire to furnish automatic weapons firepower or to provide security. Tanks are used to assist the base of fire only when the maneuvering force is required to attack dismounted because of terrain conditions or obstacles which effectively preclude taking maximum advantage of the mobility and shock characteristics of tanks, or when direct illumination by the BOIF is

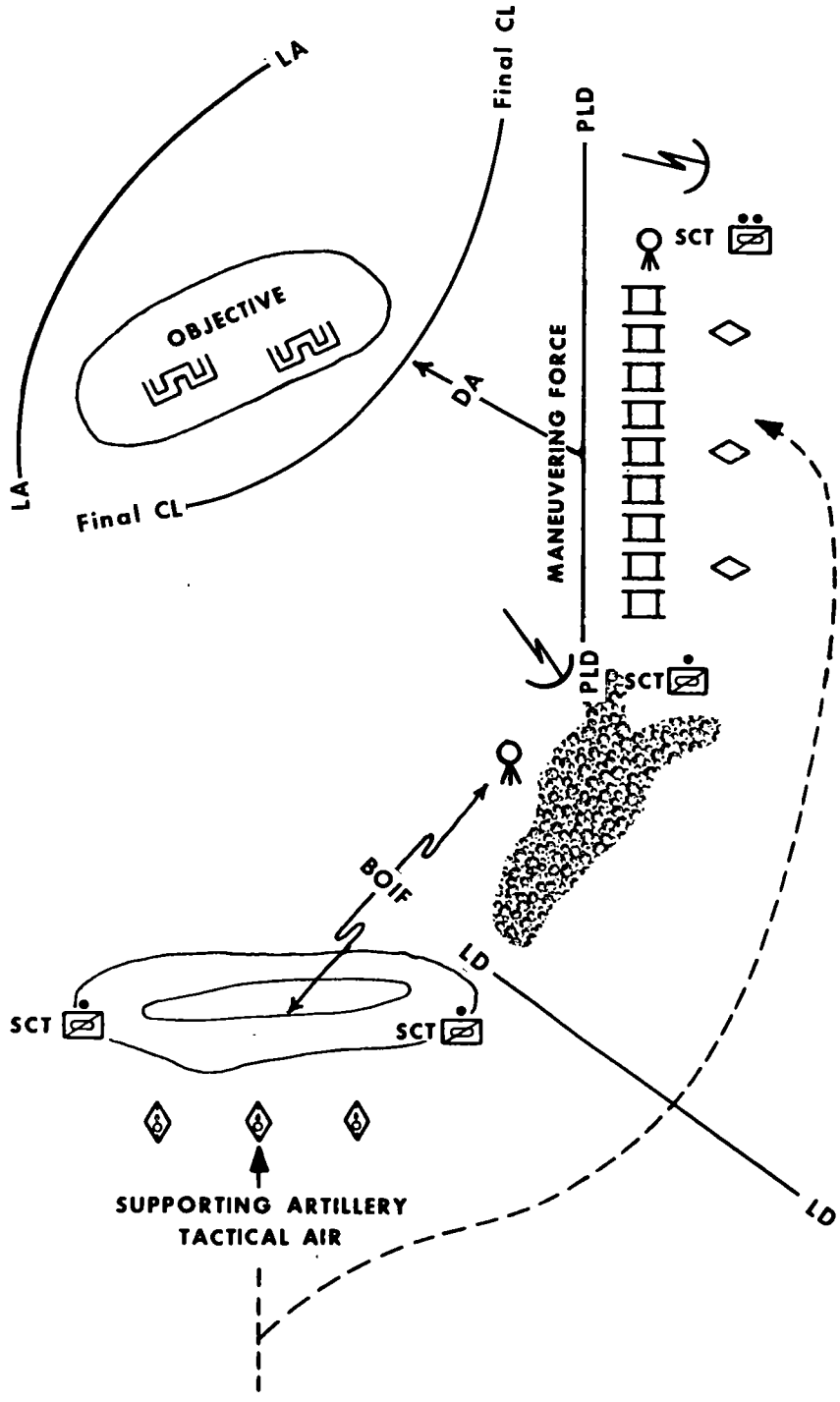


Figure 11–8. Armored cavalry troop in night attack.

required and illumination by the maneuver element is not feasible.

11–23. Conduct of the Night Attack

a. During the night attack, circumstances may require the troop commander to change his plan. He must exploit favorable developments without hesitation and must overcome obstacles as quickly as possible. Decisions to alter the scheme of maneuver are influenced by restrictions imposed by operating at night. In the event committed elements cannot be shifted to take advantage of a changing situation, the alternatives are to use uncommitted parts of the troop or to shift supporting fires. The maneuvering force closes on the objective in the shortest possible time. This force is committed over terrain that is favorable for rapid movement toward the objective unless other tactical considerations dictate significant advantages in use of less favorable terrain. Effects of terrain on movement during hours of darkness or reduced visibility and the ability to move without regard to covered or concealed routes are the determining factors in the final selection. The maneuvering force attempts to reach the objective by continuous movement; however, when the situation requires, or when illumination commences, fire and movement are executed by elements of the maneuvering force. Aggressive action and simplicity are the keynotes to successful attack. The troop night attack is almost identical to that of a company team. For more details on procedures and techniques see paragraphs 10–12 through 10–18.

b. The BOIF furnishes continuous fire support and illumination to the maneuvering force. Initially, fire is directed on the objective and other enemy-held areas that can delay the advance of the maneuvering force. As the maneuvering force approaches the objective, and supporting fires are masked, the fires are lifted or shifted. This is accomplished at the final coordination line (CL). If the assaulting force consists of tanks and mounted infantry, the base of fire may continue to place overhead fire on the objective until just before the rifle element dismounts. Elements in the BOIF prepare to displace forward as the maneuvering force moves onto the objective. Forward movement of the BOIF is conducted on order of the troop commander. It is important that all elements of the base of fire do not displace at one time. Mortars are displaced in such a manner that fire support and on-call illumination is always immediately available.

11–24. Actions on the Objective

a. Immediately upon occupying the objective, the troop deploys to repel a counterattack. Visible illumination is terminated and active IR surveillance initiated during the period necessary for dark adaption and installation of passive night operating aids. Mortars and other organic weapons in the BOIF displace forward by echelon and cover possible avenues of enemy approach to the front or flanks of the objective by fire. Ground and aero scouts are used to provide security to the front and flanks and to maintain surveillance of the location and activity of the enemy. Supporting artillery and tactical air are used to reinforce the position against hostile counterattacks.

b. The troop may be required to remain on or in the vicinity of the position and to defend it. It also may be required to continue the attack. In either case, time permitting, vehicles are resupplied without delay and placed in the best available positions to accomplish the mission and, at the same time, provide maximum protection. Casualties are evacuated and troops are redistributed as necessary. The unit situation, strength, and vehicle and ammunition status are reported. Prisoners are interrogated briefly for immediate tactical information and sent to PW collecting points as quickly as possible. For details on organization and conduct of the night defense, see chapter 13.

11–25. Exploitation and Pursuit

If the plan calls for a continuation of the attack, the troop is deployed on the position facilitate resumption of the advance. If this procedure is followed, only brief oral orders will be required to continue the attack. For a detailed discussion of the exploitation phase, see paragraph 10–11.

Section V. ARMORED CAVALRY PLATOON IN THE NIGHT ATTACK

11-26. General

This section discusses specific techniques in the conduct of a night attack by an armored cavalry platoon. The information contained in this section must be used in conjunction with other sections of this chapter and chapter 10.

11-27. Basic Considerations

The basic considerations used in planning a day attack are applicable in planning and conducting a night attack. In addition, specific considerations include the following:

a. To control his platoon in the night attack, the platoon leader uses more restrictive control measures, the type and number of which depend on the mission. In the planning stage, the platoon is normally assigned an objective by the troop commander. This objective is a control measure in itself and all efforts of the platoon are directed toward its capture. Other control measures that may be used are the attack position; line of departure (LD); direction of attack (DA); checkpoints; probable line of deployment (PLD); final coordination lines (final CL); and limits of advance (LA).

b. The conduct of a night attack as an independent armored cavalry platoon requires that all desired illumination be provided by the organic support squad, or by maneuvering tanks, with searchlights.

11-28. Planning the Night Attack

The platoon plan of attack includes the scheme of maneuver and the plan of fire support. Before completing his plan of attack, the platoon leader conducts a reconnaissance. Reconnaissance should extend down to the lowest level possible. The platoon leader's plan must be simple, yet it must contain all essential details. Simplicity is the keystone for successful night attacks. The plan should include—

a. The composition and location of the base of fire; targets to be fired on; control measures to lift or shift fires; area of illumination; measures to commence, lift, and suspend illumination; and effective use of all available combat support elements.

b. The composition of the maneuvering force, the route it will take to the objective, and, if applicable, the time when the rifle squad will dismount.

c. Provisions for security during the attack, reorganization and consolidation on the objective, and exploitation or resumption of the advance if required.

11-29. Composition of Forces in the Night Attack

a. The maneuvering force contains the maximum available combat power. It seeks to strike the enemy force on the flanks or in the rear. In a mounted night attack the armored cavalry platoon normally uses the tank section and rifle squad as the maneuvering force. Mounted scout elements accompany the maneuvering force to provide flank security and to assist in movement of the force by reconnoitering, reporting, and recommending routes. The scouts assist in control by providing guides when required. If a dismounted attack is conducted, the maneuvering force may consist only of scouts and the rifle squad (fig. 11-9).

b. The BOIF consists of the minimum force necessary to limit the enemy's capability to interfere with the movement of the maneuver elements and, within its capabilities, to neutralize or destroy the enemy. In the platoon, it normally consists of the support squad. Tanks, riflemen, or scout elements may assist the BOIF. Tanks are placed in the BOIF only if the terrain or enemy dispositions prevent their employment in the maneuvering force or if direct illumination is required and cannot be provided by the maneuver element. Riflemen and scouts may be employed to assist the BOIF when such employment is dictated by the factors of METT and when the composition of the enemy force is such that friendly automatic weapons can provide effective suppressive fire. Supporting fires and illumination for the platoon are planned by the platoon leader. If support squads are massed under troop control, mortar fire is requested through the troop commander. Supporting artillery fires and illumination are requested through the troop commander or the artillery forward observer when available.

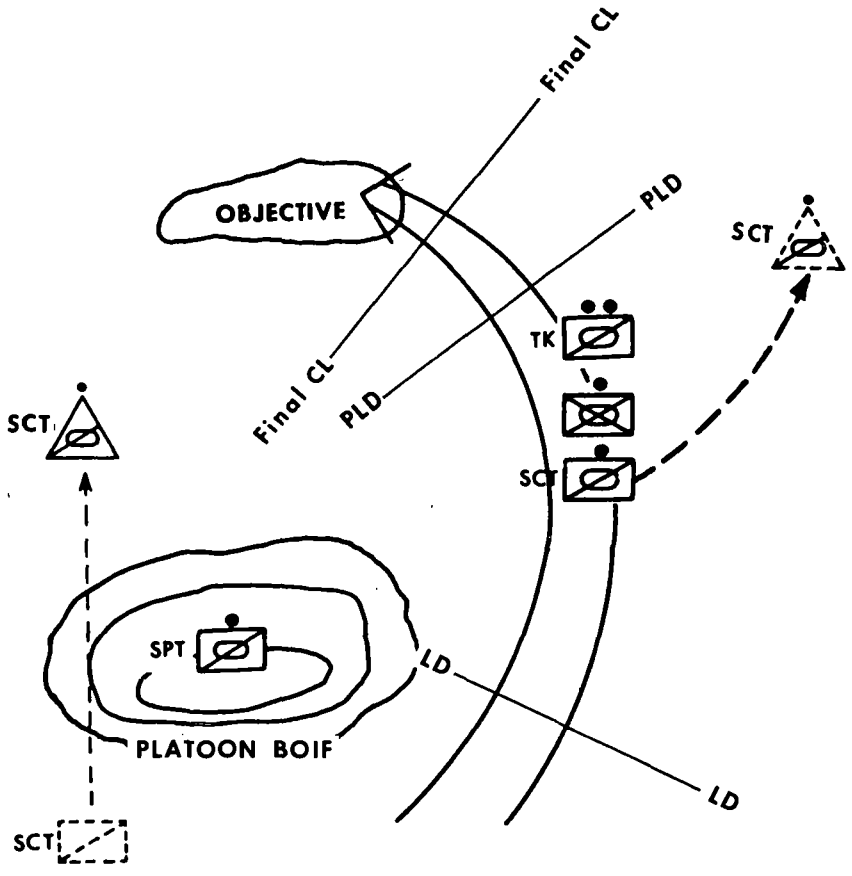


Figure 11–9. Night attack formation, armored cavalry platoon.

11–30. Conduct of the Night Attack

a. The maneuvering force closes with the enemy as aggressively and rapidly as possible. Maximum use is made of the cover of darkness during the advance, and the maneuvering force advances as closely as possible to the objective before employing illumination, fire and movement. Illumination normally is not employed until the enemy places effective fires or illumination on the maneuver element of the platoon.

b. Maximum fire is placed on the enemy by the maneuvering force as soon as it is within effective range, and accurate, aimed fire can be directed on the enemy position. An exception to this technique occurs when the maneuvering force is able to advance without detection. The fire of the maneuvering force, reinforced by the BOIF, pins down the enemy, denies him observation and movement, and destroys his troops and equipment.

c. The platoon leader makes the decision as to when and where to dismount the rifle squad. Consideration of the ability of dismounted troops to move during the hours of darkness is one of the determining factors in this decision. When the rifle squad dismounts, the squad leader must insure that there are personnel operating with each of the three tanks. It may be possible for one fire team to operate with two tanks, while the other fire team operates with one tank. The terrain and situation will dictate how the squad is employed to provide maximum security for the tank section and to assist in seizure of the objective.

d. The mission of the BOIF is to pin the enemy to the ground and neutralize his weapons, observe and report enemy activities, assist in control of the maneuver unit, and illuminate the objective, if required, thereby permitting freedom of action by the maneuvering force. The BOIF normally *does not join the maneuver force* in the final assault against the objective. The nonorganic base of fire consists of supporting artillery, armed Army aircraft, tactical air, and naval gunfire. The use of tanks in a cavalry platoon BOIF is justified *only* when terrain precludes their employment in the maneuvering force or when illumination, if required, can only be provided from the BOIF position. Supporting fires are lifted or shifted at the last possible moment to keep the enemy troops pinned down until the assault elements have closed with them. These fires must be lifted or shifted soon enough to prevent losses to friendly troops. Preselected, readily identifiable terrain features and/or signals are used to coordinate the lifting and shifting of supporting fires and illumination (final CL) and the final deployment of the attacking echelon in conducting the assault against the enemy position (PLD).

e. The conduct of the attack is similar to the discussion for the company team found in paragraphs 10–12 through 10–18. Applicable platoon techniques are found in paragraphs 10–19 through 10–24.

11–31. Actions on the Objective

a. When the objective is taken, the position is consolidated and the platoon is reorganized for subsequent action.

b. The objective is consolidated in minimum time. Plans for consolidation are included in the platoon operation order for the attack. Actions by the platoon during consolidation include—

(1) Establishing security by the scout section to the front and flanks of the objective. Maximum numbers of night operating aids are employed in this mission.

(2) Redistributing personnel, equipment, and ammunition as necessary.

(3) Report by the platoon leader to the troop commander on the status of the platoon.

(4) Evacuation of casualties, prisoners, and damaged equipment.

(5) Accomplishing supply as time and the situation permit.

c. A discussion of the organization and conduct of a night defense by elements similar to the armored cavalry platoon and using the same techniques is found in chapter 13.

11–32. Resumption of Advance

A plan is adopted and positions are assumed that enable the platoon to readily resume operations. The platoon may reorganize defensively on the position. It may also be required to accomplish reorganization while continuing the advance after over-running an objective. Continued movement allows little opportunity to reassign individuals within the platoon. The platoon leader receives status reports from each section and squad and reports this information to the troop command post. When the situation permits, he makes the necessary changes to insure the continued operational effectiveness of his platoon.

PART FOUR
NIGHT DEFENSE
CHAPTER 12
INTRODUCTION TO THE NIGHT DEFENSE

Section I. GENERAL

12–1. Introduction
Although there are differences in night defensive techniques, doctrine for the night defense is the same as for the daylight. Planning and control measures are more detailed for the night defense. Counterattacks or spoiling attacks to be executed during the hours of darkness avoid complicated schemes of maneuvers or intricate coordination procedures which cannot be accomplished because of reduced visibility.

12–2. Principal Difference
The principal difference between the daylight and night defense is in the organization of the security area and the greater use made of night vision devices, surveillance aids, antiintrusion devices, and artificial illumination to compensate for reduced natural visibility. Night vision devices can be used effectively in night defense operations by employing them in observation posts and in listening posts within and without the perimeter. Improved night visibility permits early detection, identification and engagement of enemy forces. The starlight scope is particularly effective when used in conjunction with the AN/PPS–4 ground radar surveillance equipment. Enemy forces are detected by radar and identified through improved vision provided by the starlight scope.

12–3. Purpose
Defensive operations, whether conducted in the day or at night, are actions to prevent, resist, repulse, or destroy an enemy attack. The defense is undertaken to develop more favorable conditions for subsequent offensive operations, economize forces in one area in order to apply decisive force elsewhere, destroy or trap a hostile force, deny an enemy entrance to an area, or reduce enemy capabilities with minimum losses to friendly forces.

Section II. FORMS OF DEFENSE

12–4. General
The fundamental forms of defense are the mobile defense and the area defense. Most defensive operations are some variation of either the mobile or area defense.

12–5. Mobile Defense
a. The mobile defense is that form of defense in which minimum forces are deployed forward and priority is given to use of mobile combat elements. Primary reliance is placed upon the use of offensive action by the reserve to destroy enemy forces which have penetrated friendly positions.

b. In the mobile defense a mechanized infantry force is more effective than an infantry force. The force may participate as part of the security forces, forward defensive forces, or the reserve (striking force). Blocking positions or strong points are organized for all-round defense. Alternate or successive blocking positions are established in depth. A combat outpost (COP) normally is not used in the mobile defense.

c. A battlion does not have the capability of conducting a mobile defense; however, it may participate as part of a larger force. In such an operation, the battalion may be employed in the forward defense force, or in the mobile reserve. When a battalion is employed on the forward edge of the battle area

(FEBA) as part of a mobile defense,it may accomplish its mission by conducting an area defense until forced to delay, at which time it contains the penetration until the counterattack by the mobile reserve.

12–6. Area Defense

In the area defense emphasis is placed upon retention or control of specific terrain. Reliance is placed upon the ability of forces deployed on positions in the forward area to stop, repel, and eject the attackers.

12–7. Spoiling and Counterattacks

Spoiling and counterattacks are offensive actions employed in the night defense.

a. The spoiling attack is a tactical maneuver employed to seriously impair a hostile night attack while the enemy is forming or assembling. Armor or mechanized infantry units in conduct of the defense may attack enemy assembly areas in front of the FEBA. The spoiling attack at night is conducted in accordance with the provisions of Part Three.

b. Normally, night counterattacks require detailed coordination with friendly units containing the penetration and detailed coordination of supporting fires. Night counterattacks are conducted as discussed in Part Three.

Section III. ECHELONS OF FORCES IN THE DEFENSE

12–8. General

Forces are echeloned in depth during night defensive operations. These forces are distributed into three areas—the security area, the forward defense area, and the reserve area. Each of these areas is allocated forces and fires as part of the overall defense plan. Infantry, mechanized infantry, armor, and armored cavalry units, reinforced, if necessary, may be employed in any of the areas (fig. 12–1).

12–9. Security Area

The security area begins at the forward edge of the battle area (FEBA) and extends as far to the front and flanks as security elements are employed. Security forces provide early warning and defeat, deceive, disorganize, and delay the enemy.

a. General Outpost (GOP). The GOP is organized and controlled by the division to execute offensive, defensive, and delaying actions to defeat, disorganize, deceive, and delay the enemy. The GOP force may be provided from the division reserve. The GOP may be a brigade, or elements therof; an armored cavalry squadron reinforced; or a battalion task force.

b. Line of Observation and Surveillance (LOS). The LOS is organized and controlled by the COP force to maintain contact with the GOP, assist the passage of the GOP to the rear, and subsequently to gain and maintain observation and/or surveillance of enemy forces. The LOS provides the defending force with intelligence. The LOS maintains contact with the GOP through liason as necessary. It acquires information by observation and surveillance of the enemy through visual contact, and by employing combat surveillance equipment. The LOS may be established by elements of the brigade reserve or by elements of battalions in the forward defense area. The battalion scout platoon or reconnaissance platoon with attachment of all or part of the battalion ground surveillance section is particularly well suited for this mission. If available, air cavalry elements are placed in support of the LOS. During daylight operations, the LOS may be combined with COP; however, during night operations, the LOS is a separate security element. Therefore, the LOS is normally established for both daylight and night operations to avoid excessive movement, ease the establishment of LOS positions, and to provide for smooth passage of the GOP to the rear.

c. Combat Outpost (COP). The COP is a security element of the brigade. The primary mission of the COP is to provide the brigade and battalions timely warning of the enemy's approach and to deny him close ground observation. The COP assists the passage of the LOS to the rear, gains and maintains enemy contact, and engages the enemy with direct and indirect fires to delay, disorganize, deceive, and to develop the situation to the maximum. The COP should be organized and equipped to half or defeat the enemy reconniassance units of the same organizational level for which

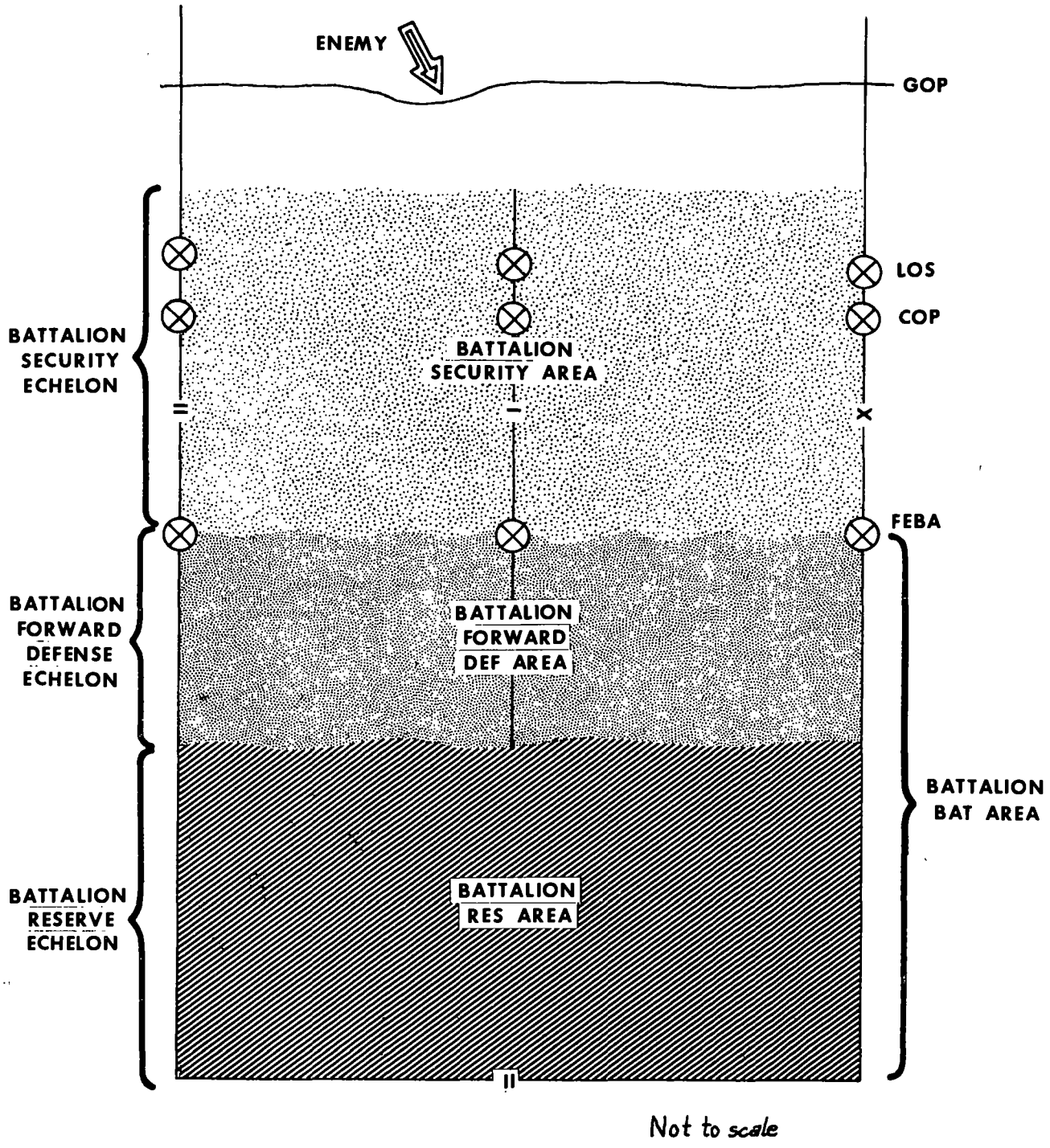


Figure 12–1. Battalion defensive echelons (schematic).

the COP is providing security. Further, the COP should be of sufficient strength to allow forces in the forward defense area to maintain a minimum alert status. Detailed organization of the COP is discussed in FM 7–11 and FM 7–20.

d. Observation and Security Groups (O&S). When a COP is not established, platoons establish observation and security groups forward of the FEBA within effective small-arms range. These groups are usually provided by the forward platoons. They vary in size from two men to a rifle squad reinforced with machineguns, antitank weapons, and APC's or tanks. Observation and security groups employ equipment such as anti-intrusion devices, night vision devices, radar, noisemaking devices, and claymore mines. They provide warning of the enemy's approach during the hours of darkness and cause the enemy to deploy prematurely. As the O&S groups withdraw to prepared positions on the FEBA, supporting fires are placed on the enemy to slow and disorganize his advance.

12-10. Forward Defense Area

The division forward defense force organizes the forward area in order to destroy, repel, or canalize the enemy. It is that area bounded by the FEBA, the flank, and the forward brigade rear boundary.

a. The battalion forward defense area extends rearward from the FEBA to include the area organized by the forward committed companies.

b. Forces in the forward defense area in the night mobile defense warn of impending attack, delay and disorganize the enemy, and canalize the attacking enemy into an area suitable for counterattack by the reserve.

c. Forward defense forces (forward defense echelon) in the area defense engage the enemy in decisive combat in order to destroy his forces and retain specific terrain.

12-11. Reserve Area

a. The reserve area extends from the forward defense area to the battalion's rear boundary. The reserve force occupies the reserve area and is composed of those uncommitted forces that are held under the battalion control. Through the reserve, the commander retains the initiative and the ability to maneuver in order to bring his destructive capabilities to bear on the point and at the time of decision. The reserve may consist of maneuver forces, nuclear weapons, or both.

b. Reserves are normally organized at battalion, squadron, or task force level and higher. The reserve provides defense in depth by blocking local penetrations, by protecting against airborne and airmobile attacks to the rear of the FEBA, and by conducting counterattacks within its capabilities.

c. The commander normally informs the next higher headquarters of his intention to commit his reserve.

Section IV. CONDUCT OF THE NIGHT DEFENSE

12-12. Conduct of the Night Defense—Security Area

Radar and night observation aids are used on the LOS and subsequently on the COP to detect approaching enemy forces. Normally, the enemy is first detected by use of radar. Indirect fires are called for and adjusted. If tanks are present on the COP, the enemy is illuminated by Xenon equipped tanks using the visible light mode, and engaged at ranges of 2,500/3,000 meters. This method provides excellent point target acquisition and long range engagement. With the exception of image intensifier devices, however, it provides almost continuous signature which degrades the security and deception of the defender against enemy forces that are capable of detecting and reacting to active systems on the battlefield. To maximize security, the defender, by limiting the use of direct active systems, may use artificial illumination provided by artillery to achieve adequate target recognition. As the enemy comes within the viewing range of the passive systems, artificial illumination is stopped and the attacker is fired upon by weapons with passive night viewing devices. This method provides for retention of maximum security and deception by the defending force. The COP wthdriaws before becoming engaged in decisive combat. The withdrawal of the rifle platoon from the COP is discussed in FM 7-15.

12–13. Conduct of the Night Defense on the FEBA by the Rifle Company

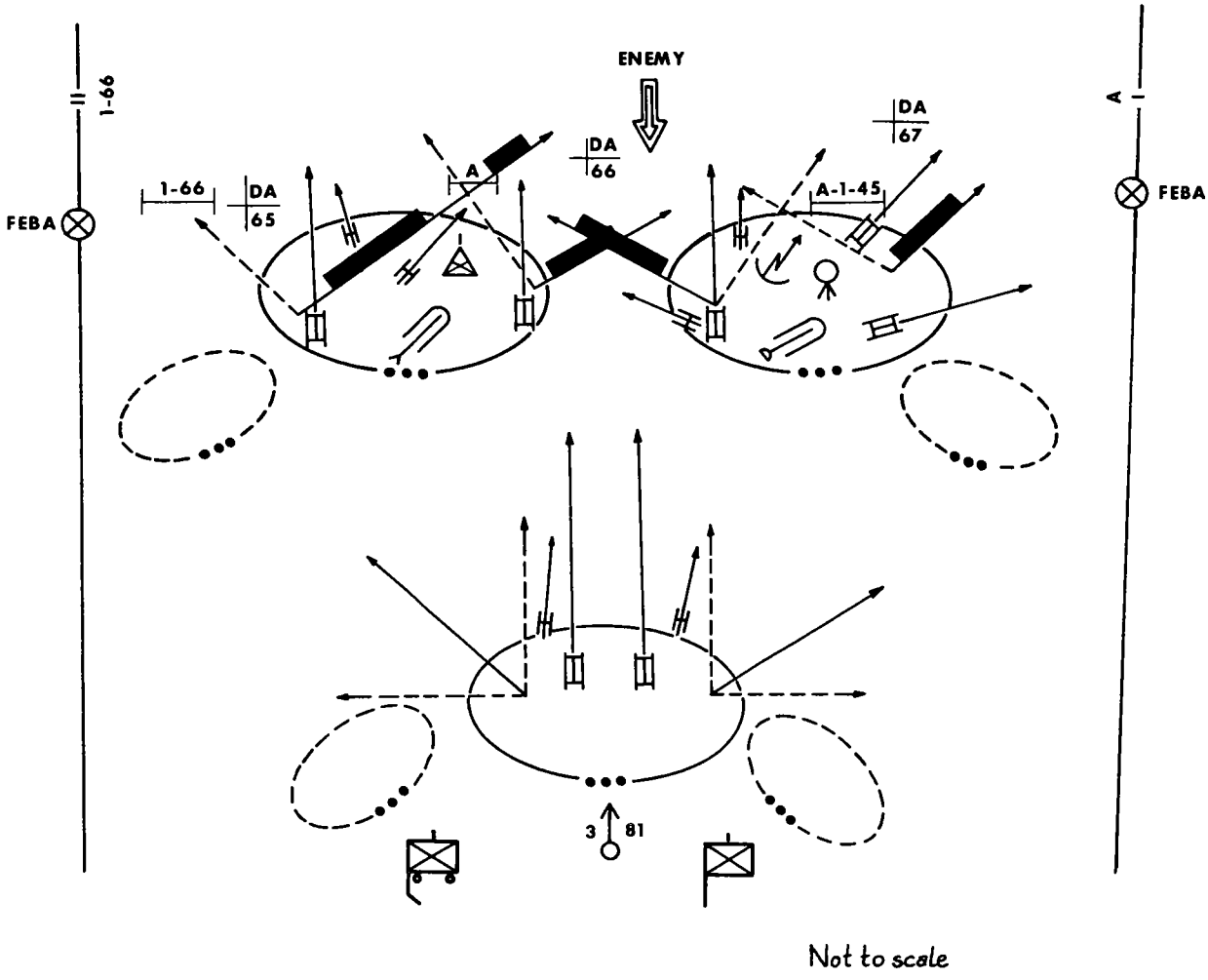
a. Area Defense. The forward platoons on the FEBA are alerted to the impending enemy attack and prepared to receive elements of attack and prepared to receive elements of the LOS/COP as they withdraw to or through their positions. Detection devices placed in support of the LOS or COP are rapidly emplaced to assist in the detection of the enemy's advance. Normally, indirect illumination is used extensively to expose the enemy as he approaches the FEBA. This permits the rapid adjustment and placement of indirect and direct supporting fires upon the enemy. However, the use of visible illumination during this period of the defense also aids the enemy in his advance toward friendly positions. Accordingly, artificial illumination is used to the minimum extent necessary to place effective fires upon the attacker. As the enemy approaches within range of the passive systems, visible illumination ceases and night vision devices are employed to place accurate fire on the enemy's attacking formations. As a general rule, before the enemy begins his final assault, weapons are not fired until targets are visible. Normally crew served weapons will not fire until the final protective fires are called. However, individuals equipped with weapons equipped with night vision devices, fire at the enemy as he comes within range of their devices and the effective range of their respective weapons. Leaders may direct some weapons equipped with night vision devices to fire tracers at the enemy and thereby enable effective fires to be placed against his formations by individuals not equipped with night vision devices. Effective fire may be placed on area type targets through the use of range cards, predetermined firing data, and stakes. When the enemy starts his assault, the platoon leader calls for final protective fires in the threatened area. Hand grenades, claymore mines, and other explosive devices are used to disrupt or repel the enemy's attack (figs. 12–2 and 12–3).

b. Mobile Defense. In the mobile defense the rifle company is usually airmobile, mechanized, or motorized. The considerations for the conduct of the defense at night are essentially those outlined in *a* above. Primary differences are outlined below.

(1) Greater use is made of observation and security groups at night because of the wider gaps existing between battalions permitting enemy infiltration in strength. These group are equipped with night vision and surveillance devices to assist in detecting the attacker.

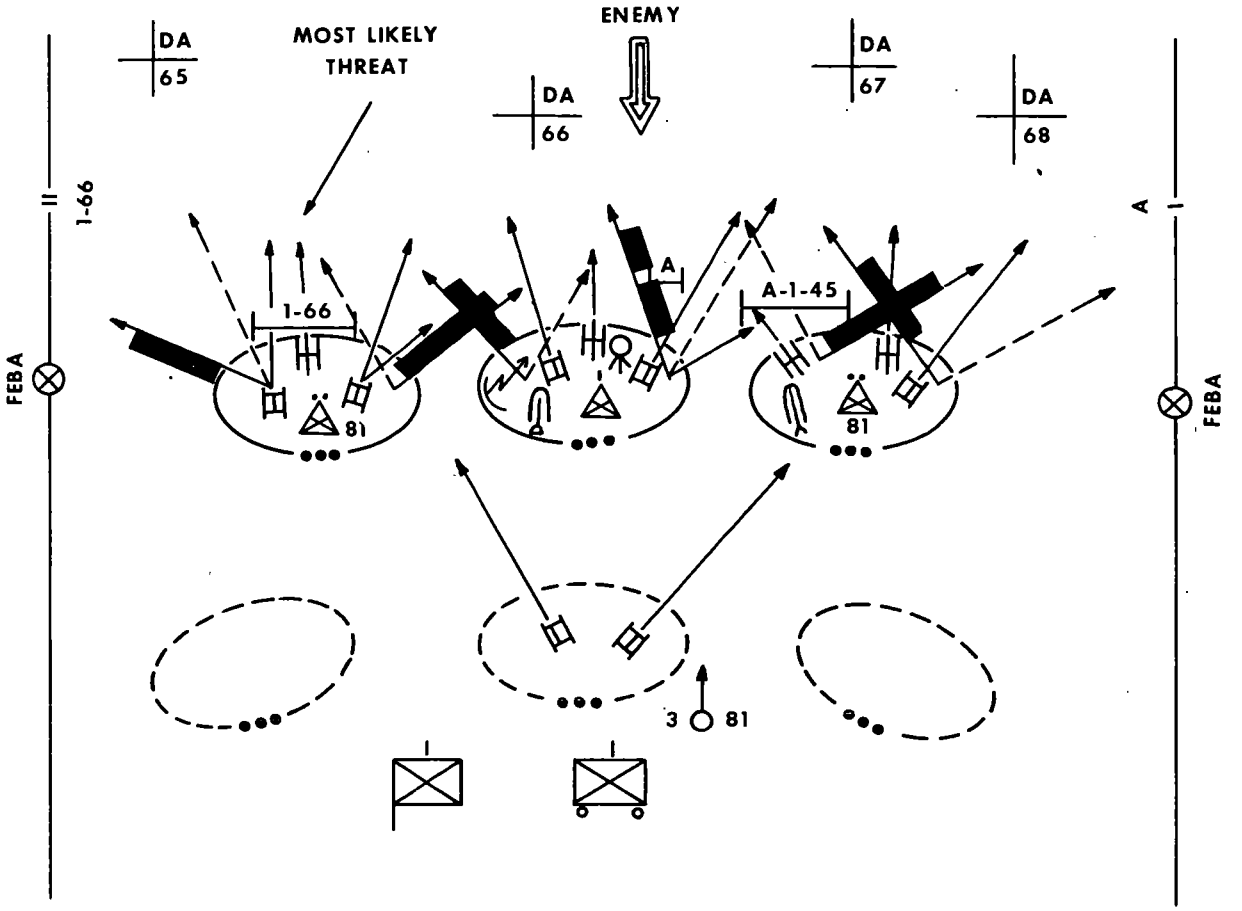
(2) When the rifle company is employed as part of a battalion in the division reserve, it conducts night offensive operations as described in Part Three.

c. Perimeter Defense. The rifle company may have to adopt the perimeter defense when it is separated from the remainder of the battalion either by enemy action or by its assigned mission. It is frequently used when the rifle company is apart from the battalion, in reserve positions, or in assembly areas (fig. 12–4). The platoons on the perimeter are generally organized in the same manner as described above in this section for the defense, except that the company front is circular rather than linear. In close terrain or in the jungle, platoons are assigned narrower frontages and the distance between platoons closely approximate the distances between foxholes within the platoon.



NOTE: SUPPLEMENTAL AND ALTERNATE POSITIONS WOULD BE SELECTED FOR ALL WEAPONS. INDIRECT FIRE TARGETS WOULD BE PLANNED THROUGHOUT THE BATTLE AREA AND INDICATED BY CROSSES.

Figure 12–2. Rifle company in defense.



NOTE: SUPPLEMENTAL AND ALTERNATE POSITIONS WOULD BE SELECTED FOR ALL WEAPONS. INDIRECT ARTILLERY FIRE WOULD BE PLANNED THROUGHOUT THE BATTLE AREA AND INDICATED BY CROSSES.

Figure 12–3. Company defense area, three platoons on FEBA.

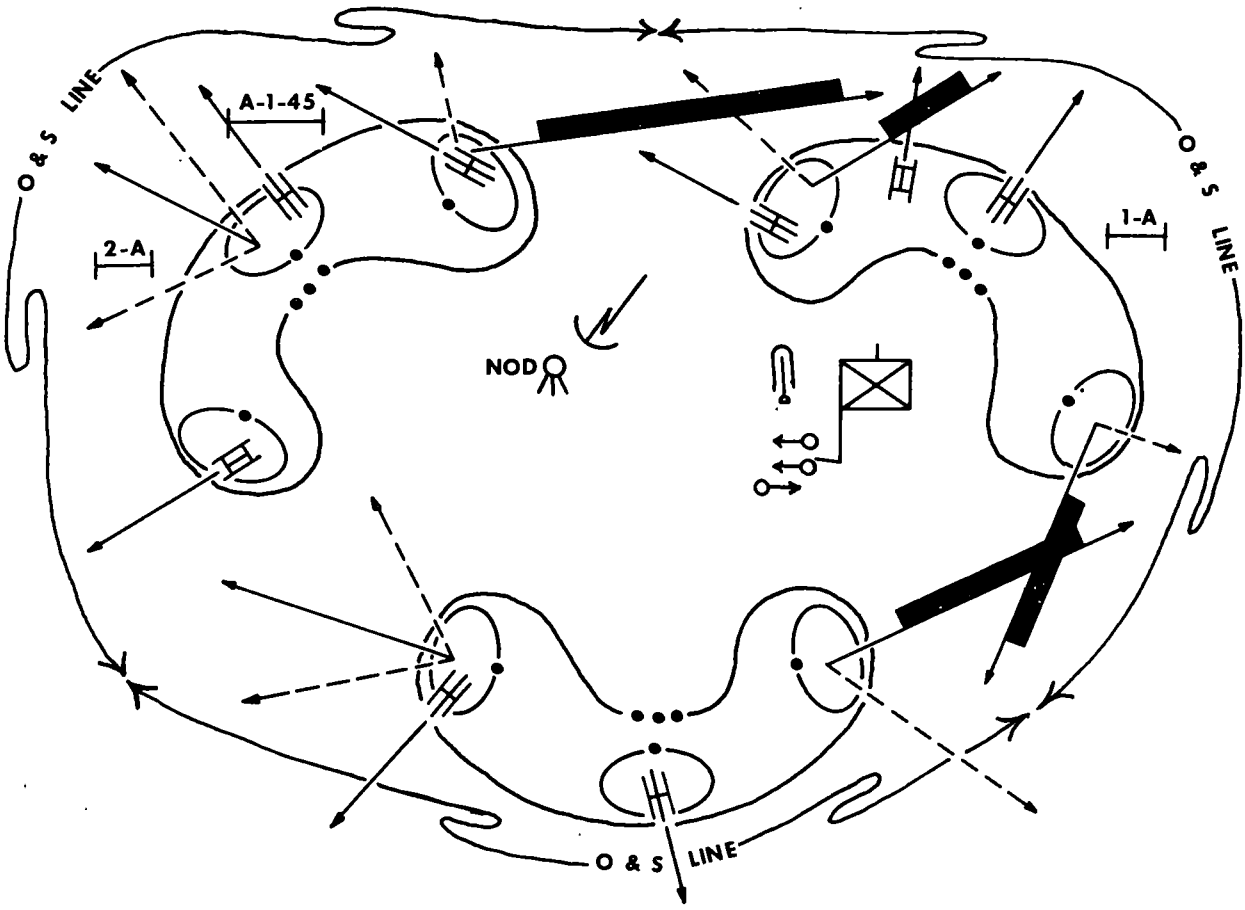


Figure 12–4. Rifle company in a perimeter defense.

Section V. NIGHT COUNTERATTACKS

12–14. General

a. Counterattack plans are prepared concurrently with plans for the defense. These plans are rehearsed for day and night implementation as time and security permit. If the enemy penetrates friendly positions during the hours of darkness, every effort is made to block and contain the penetration. The base of the penetration is sealed off with artillery and mortar fires. All available fires, both direct and indirect, are placed into the penetrated area to destroy or delay the enemy's consolidation of the position. However, if a counterattack cannot be delayed until adequate illumination levels are present, all available troops not actively engaged in the defense are used to destroy or eject the enemy and to restore the lost portion of the perimeter. Usually, the counterattack is made only when the enemy attack has been slowed, stopped, or disorganized.

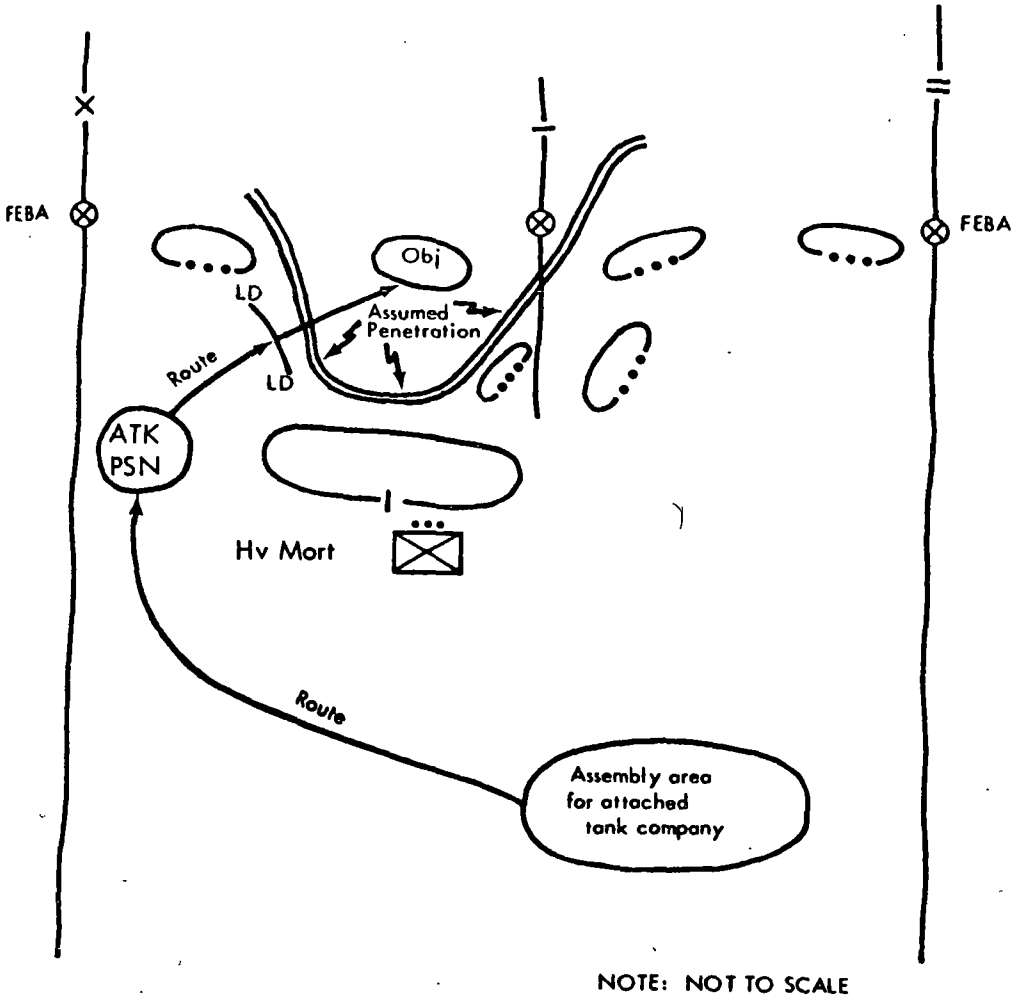
b. Normally, counterattacks are conducted during the hours of daylight because of the very stringent requirements for detailed coordination with the friendly units containing the enemy's penetration and the need to precisely coordinate the supporting fires of all

these units with the counterattacking force. All friendly elements within the penetration are attached to the commander of the maneuvering force. Because of the close proximity of the enemy's penetration, the LD is the LC for the counterattacking force. A probable line of deployment (PLD) is used in the night counterattack. Usually, elements of the counterattacking force are deployed in their assault formations on the LD. Hence, the LD is also PLD.

12–15. Counterattack Plan

A counterattack plan (fig. 12–5) has the usual features of any attack plan. In executing the counterattack, the commander commits the resources required to accomplish the mission in a single decisive attack. Special consideration is given to the following:

a. Assumed Enemy Penetration. For planning purposes, the commander must make an estimate as to the width and depth of a penetration that he can tolerate.



NOTE: Assumption is made that one platoon of left company is ineffective as result of enemy attack.

Figure 12–5. Battalion counterattack plan (schematic).

b. Objective. The objective assigned to the maneuver force is usually a terrain feature within the penetration.

c. Direction of Attack. A direction of attack is selected which favors unity, concentration of effort, and control of the maneuver forces; effective fire support; and which facilitates use of night viewing and surveillance equipment.

d. Other Control Measures. Control measures for the night counterattack are identical to those discussed in Part Three.

Section VI. AIRMOBILE FORCES IN NIGHT DEFENSIVE OPERATIONS

12–16. General

Doctrine for the night defense is not altered by the addition of airmobile resources. An airmobile force in a defensive posture conducts itself as would any light infantry force. Conduct of the night defense is discussed in paragraphs 12–12 and 12–13.

12–17. Use of Army Aviation and Airmobile Units

a. Army aviation units may be employed in night defensive operations to enhance the ability of the supported unit to—

(1) Disperse to the maximum and yet be capable of massing rapidly.

(2) Economize forces in one area in order to apply a decisive force elsewhere.

(3) Rapidly execute offensive operations to exploit enemy weakness.

b. Airmobile forces enhance the application of the fundamentals of defense by—

(1) Reinforcing units under attack with units not in contact by airmobile delivery.

(2) Providing means to react to enemy threats from any direction, and the ability to reposition forces rapidly to block an enemy threat.

(3) Providing security and fire support through use of air cavalry and armed helicopter units.

(4) Providing transportation for the reserves to counterattack, move to defense positions, reinforce units at the COP, or organize blocking positions.

(5) Integrating armed helicopters and aerial artillery in the fire support plan.

c. An airmobile force is capable of conducting all forms of defense; however, sufficient aircraft must be available for an airmobile force to effectively perform as part of a night mobile defense.

CHAPTER 13

TANK-MECHANIZED INFANTRY TASK FORCES AND TEAMS IN THE NIGHT DEFENSE

13–1. General

Tank and mechanized infantry units are well suited to conduct night defensive operations. The fundamentals of night defense operations are the same as those of daylight operations.

13–2. Organization for Combat

Tank-mechanized infantry task forces are organized to capitalize on their complementary capabilities and minimize their respective weaknesses. This normally applies to all levels of warfare and environments.

13–3. Basic Considerations of Night Defense

a. The night defense should provide for the least possibility of surprise by the enemy and the greatest opportunity for the successful use of surprise by friendly forces.

b. Blocking positions must be planned in depth and to deny key terrain to the enemy.

c. Counterattack plans must be simple and rehearsed where possible.

d. Gaps between strong points must be controlled by fires, patrols, observation/listening posts (OP/LP), and radar.

e. Security plans must include provisions for early warning; suppression of noise, light, and unnecessary movement; and communication discipline.

f. Each position must be organized for all-around defense.

g. Initiation of fire and illumination must be rigidly controlled at the highest level practical.

13–4. Planning the Night Defense

a. Blocking positions should be capable of mutual support by fire and illumination. The task force commander designates responsibility for the control of intervals between blocking positions and times established for contact at these points. Contact is made at coordinating points by patrols from the adjacent positions. OP/LP, ground surveillance radar, passive and active night vision devices, and on-call illumination and fires also cover these intervals. Definitive guidance on control of night operating aids and phasing of illumination is provided in the NVP.

b. Mortar and artillery fires and illumination are coordinated by the fire support coordinator. This support enables the task force to engage the enemy as far out from the team blocking positions as possible. Fire and illumination available to the task force should be employed before use of team fires and illumination.

c. Control of the *initiation of all* illumination is normally retained at task force level. Termination of illumination is normally determined by the commander employing it.

d. Control of the initiation of deep mortar and artillery fires is retained at task force level. Control of team fires, supporting artillery /mortar fires and all final protective fires is delegated to the team commander. Fires may be initiated by the team commander in the event his position is subjected to attack without warning. Termination of fires is determined by the commander employing it.

e. Early warning should be established immediately by positioning the scout platoon as a security force with ground surveillance radar (s) and the NOD. Techniques employed, include the use of OP/LP and patrols in front and to the flanks of team blocking positions, and employment of ground surveillance radar along the FEBA. Ground surveillance radar is normally attached to the scout platoon, and is complemented by employment with night observation devices such as the NOD, to assist in identification. Infrared and radar detectors or SIGINT and PECM may provide early

warning of approaching forces using active infrared devices, radars, and radios. For a more detailed discussion of use of the security echelons, to include the LOS, see chapter 12 and paragraph 13–8.

f. The task force and teams must immediately implement plans to restrict mounted and dismounted movement on and between positions and to maintain light and noise discipline. Necessary movement is accomplished using passive night vision devices.

g. Radio communication is placed on listening silence and wire nets are established if time permits. Mounted messengers are provided by the teams to the task force command post (CP). Dismounted messengers are provided by each platoon to the team CP. When time and the situation permit, internal wire is installed and messengers return to their platoons. Listening silence is lifted on order of the task force commander when enemy engagement is imminent.

h. When a reserve is available at task force level, counterattack plans must be prepared. Both a day and night reconnaissance is conducted for each counterattack plan and the plan is rehearsed by key personnel. Authority to initiate and terminate illumination should be delegated to the commander conducting the counterattack. Counterattacks are planned and conducted as discussed in chapter 10.

i. Sleeping plans must be formulated and implemented at each level of command during periods of limited enemy activity. Simple alert systems must be established to bring all crews and positions up to strength as rapidly as possible.

j. Supplementary blocking positions must be reconnoitered and prepared as time permits.

13–5. The Blocking Position

The key to the night defense is the team blocking positions (fig. 13–1). These positions should be occupied during periods of good visibility to permit adequate preparation. This preparation includes the following:

a. Selection of primary tank positions and the construction of range cards for tanks (including searchlights) and crew served weapons.

b. Selection of alternate tank positions and supplemental platoon positions. Each position is prepared, recorded, and staked out with the routes to the positions thoroughly reconnoitered and marked so that the positions can be readily occupied during darkness.

c. Preparation of platoon and team fire plans to include— platoon and team designated targets; mortar and artillery targets and final protective fires; the location of the ground surveillance radar(s), starlight scopes, and NOD; and the location of security forces and their routes of withdrawal back into the blocking position (figs. 13–2 and 13–3).

d. Selection and preparation of foxholes for personnel and emplacements for crew served weapons and ground surveillance radars.

e. Locations for APC's that add to the flank or rear security of the position.

f. Establishment of OP/LP and their routes of withdrawal.

g. Planning and conducting dismounted patrols to cover unoccupied areas within the position or gaps between blocking positions. External patrols must be coordinated with the S2 and adjacent units. Contact points and times for contact are established so that adjacent patrols can exchange information. The exit and reentry points, and the number of personnel on each patrol must be disseminated to all personnel. Patrol leaders are responsible for coordinating exit and reentry with the local security elements on position. The patrols make maximum use of night vision aids to facilitate accomplishment of their missions.

h. If mechanized elements are not fully committed to the operation of OP/LP and patrols, they may be used in strengthening the local close-in security of the tanks and crew served weapons. Tank platoons must provide their own local security by maintaining one man on watch in the turret of each tank and by establishing close in OP/LP (two-man team) where they can observe all movement in the vicinity of the tanks. Vehicle mounted night vision devices must be employed in conjunction with appropriate ground mounted or handheld passive night vision devices.

i. All vehicle lights (internal and external) must either be extinguished or suppressed.

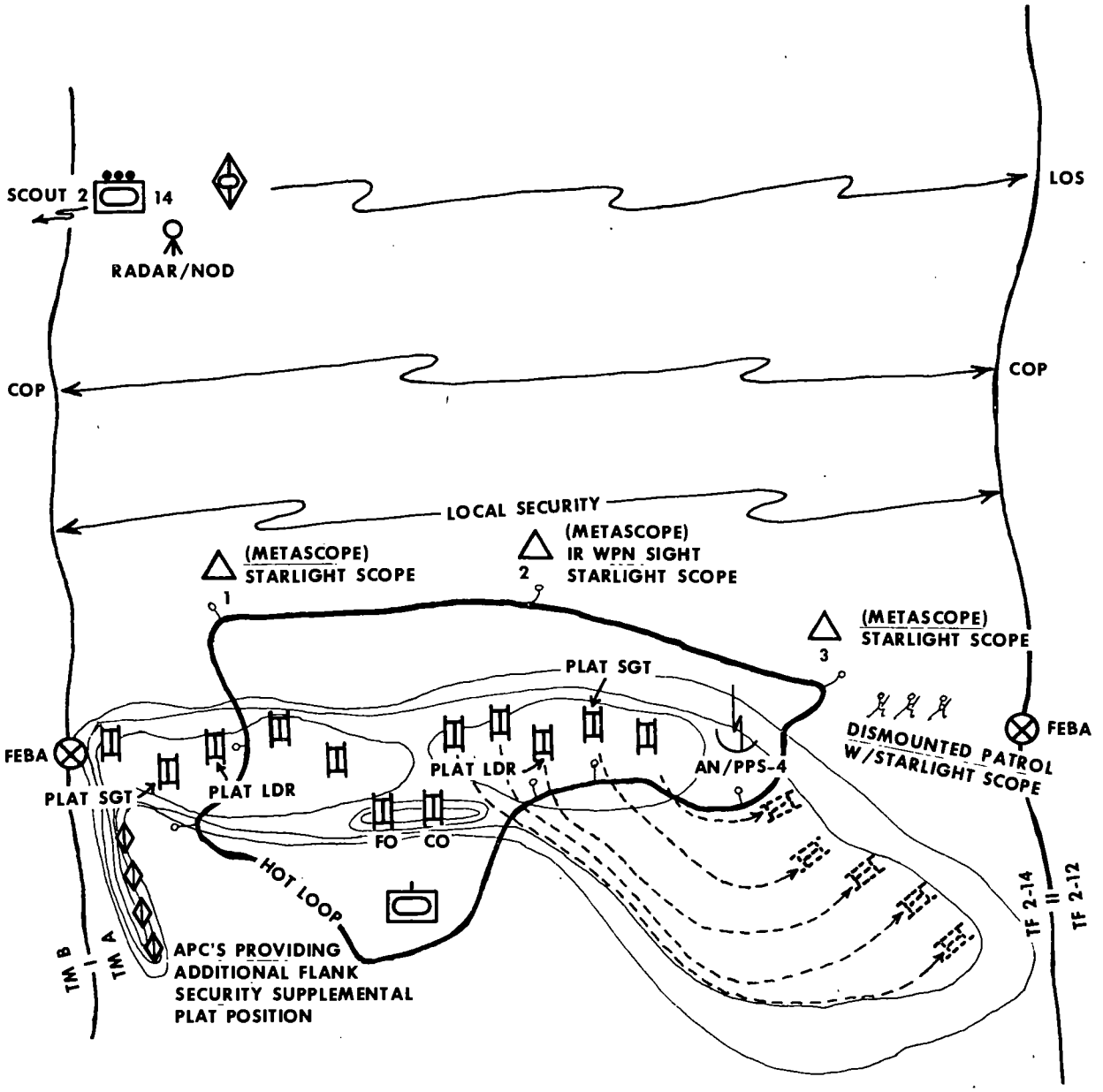


Figure 13–1. The blocking position.

Caution must be taken to insure that light is not emitted through vision devices or open hatches. Only filtered light may be used on position and it must be used with caution. Noise and movement must be held to a minimum. Vehicle engines are started only on order. When performing surveillance with tank-mounted optics, manual traverse is used; gunners switch to turret power just before the engagement. Weapons should be preloaded and ready for action to preclude premature disclosure of the position by noise when loading

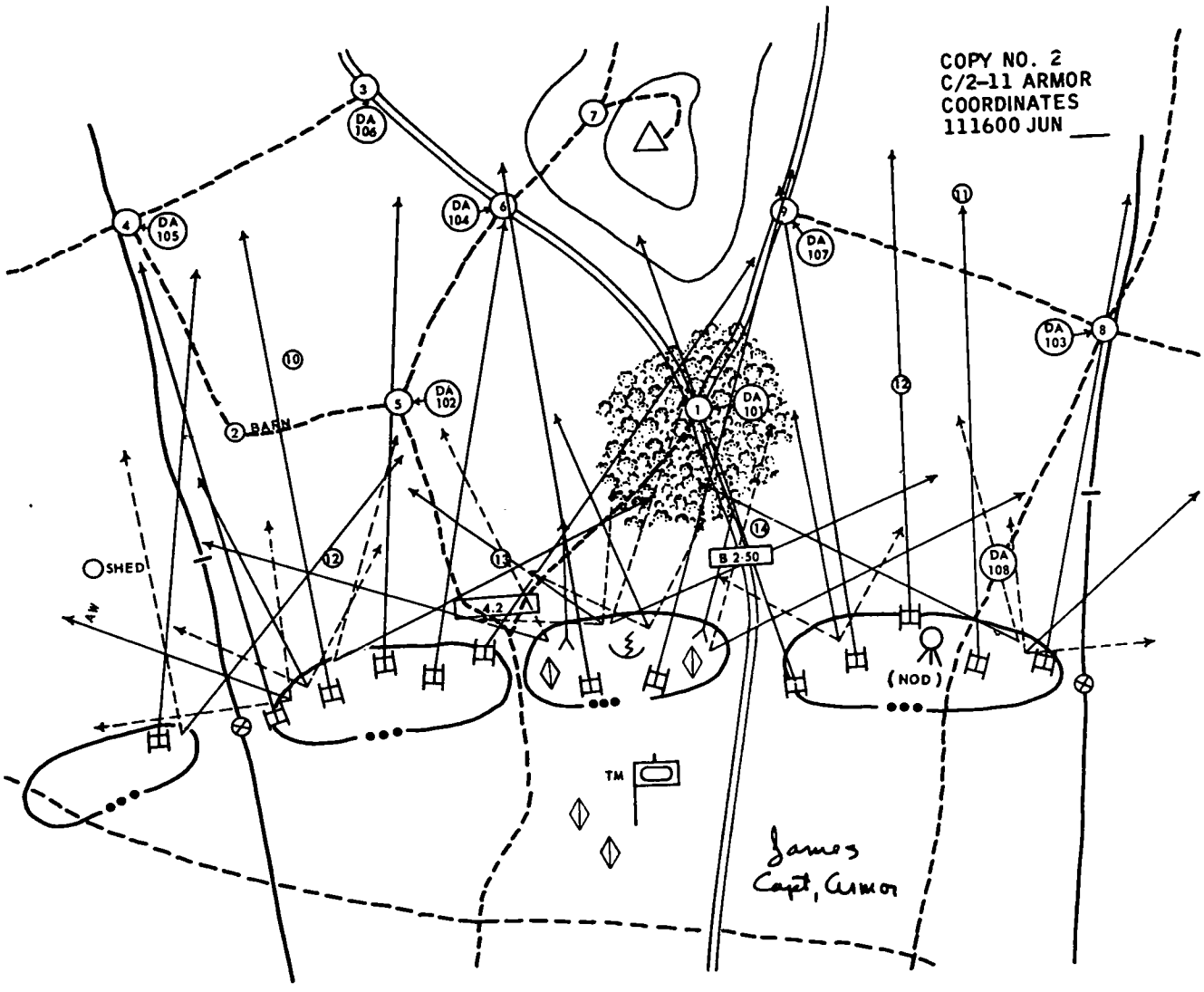
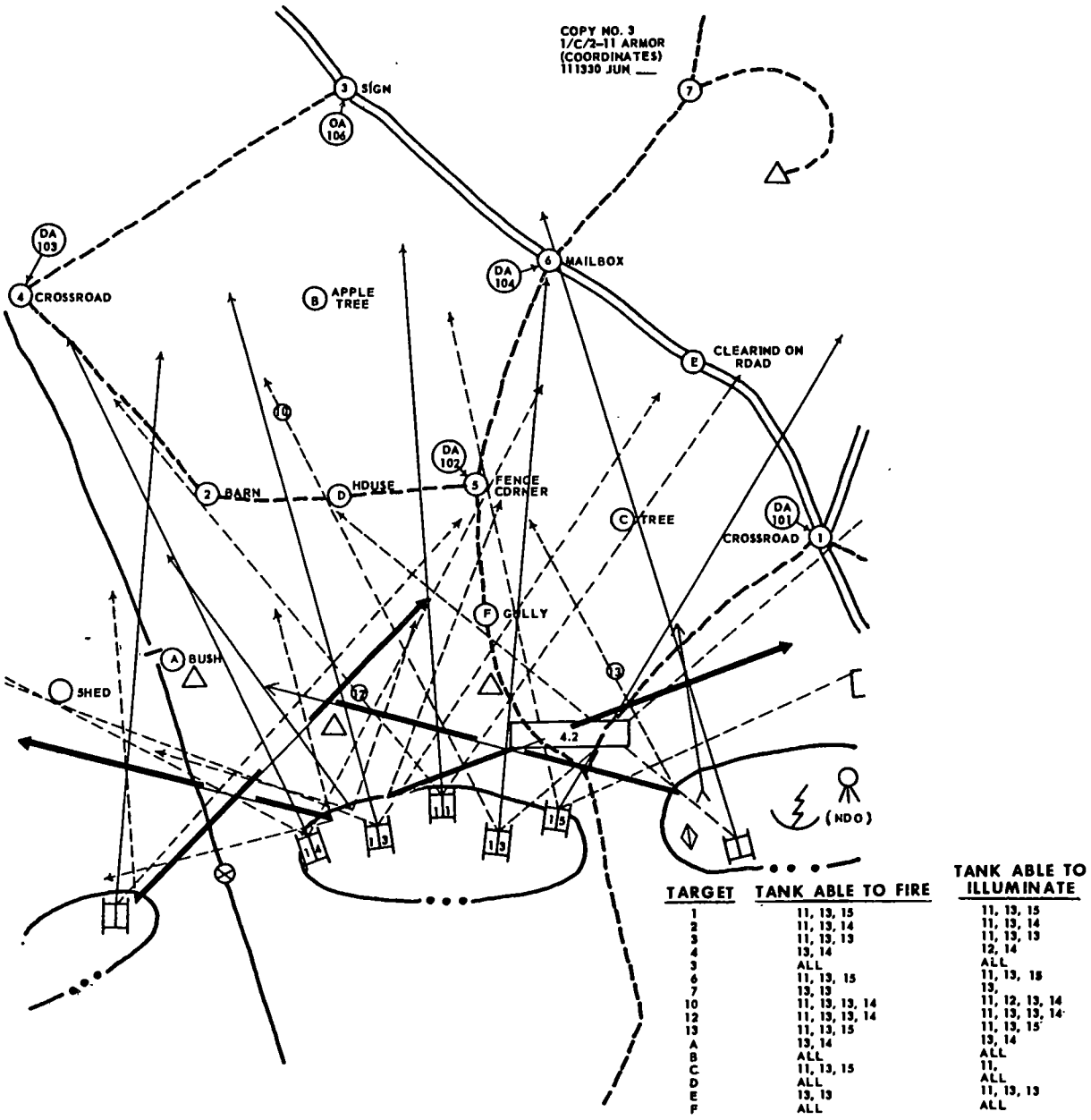


Figure 13–2. Team fire plan.

the weapons. Tank firing switches should be off until turret power is turned on to preclude inadvertent firing. Similarly, individual and crew served weapons are loaded and locked until ready to fire.

j. All-round surveillance by all available means must be organized and continuous. Crewmen on alert in tank turrets must monitor their sector of responsibility through the use of the M17 binocular when illumination is available. The M18 binocular is used to observe with infrared (IR) illumination and to detect enemy infrared activity. OP/LP are provided with the organic metascopes so that they can also monitor enemy infrared activity. Once enemy infrared sources have been detected, the range to these sources can be determined accurately by using the metascope in conjunction with the tank rangefinder. The infrared light may be used as an alternate means of communication by using it as a signaling device between the OP/LP and the defensive position. If mechanized riflemen man the OP/LP they should also be provided with infrared weapon sights. Use of starlight scopes and crew served night vision sights is inte-



TARGET	TANK ABLE TO FIRE	TANK ABLE TO ILLUMINATE
1	11, 13, 15	11, 13, 15
2	11, 13, 14	11, 13, 14
3	11, 13, 13	11, 13, 13
4	13, 14	12, 14
5	ALL	ALL
6	11, 13, 15	11, 13, 18
7	13, 13	13,
10	11, 13, 13, 14	11, 12, 13, 14
12	11, 13, 13, 14	11, 13, 13, 14
13	11, 13, 15	11, 13, 15
A	13, 14	13, 14
B	ALL	ALL
C	11, 13, 15	11,
D	ALL	ALL
E	13, 13	11, 13, 13
F	ALL	ALL

Figure 13–3. Platoon fire plan.

grated into the NVP and initially is of primary assistance to the OP/LP. Medium range night observation devices are normally positioned along the perimeter. The positioning is dictated by the increased range of the device and the longer time required for its displacement.

k. Communication by wire and messenger is implemented as a security measure until contact with the enemy has been made. FM sets are switched to RECEIVE only. All radio loudspeakers are disconnected with monitoring accomplished through headsets only. Dismounted messengers are sent to the team CP

by each platoon until wire is installed. Mounted messengers are sent from the team to the task force CP.

l. Ground surveillance radars are employed as soon as team level targets have been designated by the team commander. The radars (normally attached from task force) are positioned to cover as many of those targets or avenues of enemy mechanized approach as possible. Once the radar is positioned, the radar team leader should be given additional guidance as to the type of surveillance mission(s) to be conducted, target description, and the time to conduct the mission. With this direction, he constructs a radar surveillance card which ties him into the team fire plan and thus enables him to provide early warning over the wire net. This early warning includes the general location of a moving target relative to a team designated target so that the tanks and crew served weapons using appropriate night fire control can more rapidly detect, identify, and engage the enemy target. This technique enables the team commander to maximize the effects of available illumination and passive observation devices, minimizing the period of time required to detect, illuminate if necessary, engage, and destroy a target.

m. Infrared and radar detectors should be positioned to provide early warning of approaching enemy forces using infrared devices and surveillance radars.

13-6. Employment of Illumination in the Defense

Illumination is used in such a manner as to maximize its effectiveness during limited periods of employment. Stringent control is placed on the use of illumination to preclude premature use. Control originates at division level; however, once planning and coordination has been effected, control is normally delegated to the task force and retained at that level. A team commander must receive permission before initiating illumination. If the actual position can be concealed so that secrecy and surprise can be attained, illumination is withheld until the attacking force is within maximum effective range of the tank main gun, at which time white light flicker illumination by designated tanks is initiated simultaneously. Such lighting facilitates maximum destruction within the shortest possible time. If greater security requirements exist, infrared light from tank-mounted searchlights is used exclusively. Under normal conditions, surveillance through the use of visible or infrared illumination is discouraged since the element of surprise is lost and the position exposed. Illumination is withheld until the enemy is within effective range. If it is required to disrupt the enemy attack as soon as possible, artillery and mortar illumination and fires should be employed for initial long range engagement. As the enemy approaches the position, care is taken to insure that artillery or mortar flares do not expose the friendly positions as a result of winddrift. Searchlights are then used at closer ranges. Plans must be made to counter enemy use of illumination by directing—

a. Intense light at the source of searchlight illumination.

b. Artillery fires (surface and airburst HE, and smoke) on the suspected enemy searchlight positions.

c. Counterbattery or countermortar fire on enemy artillery or mortar sources of illumination.

13-7. Defensive Employment of Tank-Mounted Searchlights

a. General. Searchlights are used as on-call illumination to cover likely avenues of approach and to provide illumination for night counterattacks. Proper use of searchlights in coordination with OP/LP, passive viewing devices, and ground surveillance radars provides the means of gaining tactical surprise over approaching enemy troops. During employment of enemy searchlights, friendly forces direct special attention to the dimly illuminated area *outside* the edge of the enemy lightbeam. The defender should try to silhouette an advancing enemy in the beam's light.

b. Planning. Preparation for the night defense always includes the planned use of tank-mounted searchlights. In addition to normal defensive requirements—

(1) Tank searchlights are coordinated with other illumination means and tied into

the team fire plan through the NVP and fire support plan.

(2) Primary, alternate, and supplementary positions are selected.

(3) Illumination is strictly controlled to prevent premature illumination and to minimize the time required to direct, identify, engage, and destroy enemy targets.

(4) Alternate means of communication are provided.

c. Employment.

(1) Illumination coordination with higher and adjacent headquarters and control of the initiation of tank-mounted illumination is retained at task force level; however, employment of the searchlights is the responsibility of the team commander.

(2) The team commander provides for employment of the tank-mounted searchlights by integrating them into the team fire plan in accordance with the NVP and by controlling them through the platoon leaders.

(3) To integrate searchlights into the team fire plan, the team commander insures that the searchlights are capable of directing illumination on team designated targets.

(4) When directing a fire and illumination mission, the team commander endeavors to direct a maximum amount of fire and illumination into the target area to facilitate immediate engagement and destruction of the enemy.

(5) Additionally, the team commander designates the type of illumination to be used. To engage at maximum effective range, or if maximum illumination is desired, the white mode is used. If secrecy is required for initial engagement, the infrared mode is used, but because of infrared range limitations, engagement is initiated at a closer range.

(6) Illumination is normally employed using the *flicker* technique. Platoon leaders control flicker illumination by designating those tanks to illuminate initially and those to fire initially.

(7) To integrate organic searchlights and attached ground surveillance radars into the team fire plan, the following procedures are used—

(*a*) All tank range cards and the radar surveillance cards incorporate as many team designated targets as possible. These targets provide a basis to rapidly orient fire and illumination on point targets of opportunity. Data required include—

1. Azimuth (deflection) to target.
2. Quadrant elevation (QE).
3. Range.
4. Target description.

(*b*) The ground surveillance radars are given monitor and search missions. Company team targets are preset on the azimuth scale. Initially, these missions are designed to provide the team with early warning. As soon as the enemy is detected approaching the position—

1. The radar team leader alerts the forces occupying the blocking position, using the multipoint wire circuit. Collocated NOD's are used to assist in or confirm identification.

2. All crews are brought to full strength.

3. Listening silence is lifted.

4. All tank engines are started and searchlights placed on standby.

5. The mode of illumination (white or IR) to be used is designated by the team commander.

(*c*) Night observation devices are collocated with ground surveillance radars. In addition to the mission of enemy detection, identification of targets located by the radars is of equal importance.

(8) Once the team commander receives permission to start illumination he continues it as long as necessary. The authority to illuminate may be delegated to the team commander when based on conditions established by the task force NVP; for example, "Illumination may be initiated when the enemy reaches phase line Red."

(9) Individual tank commanders should move their tanks to alternate positions after employing flicker illumination 2 or 3 times from the primary position. In the defensive position, this technique provides constant illumination and decreases the effectiveness of the enemy's counterillumination.

(10) The team commander also plans to provide supporting illumination for other team

blocking positions from platoon supplemental positions.

(11) To support a counterattack, illumination is provided using one of the three methods of illumination designated for the attack (para 10–15). The counterattacking force commander controls the initiation and termination of illumination through the command net (fig. 13–4).

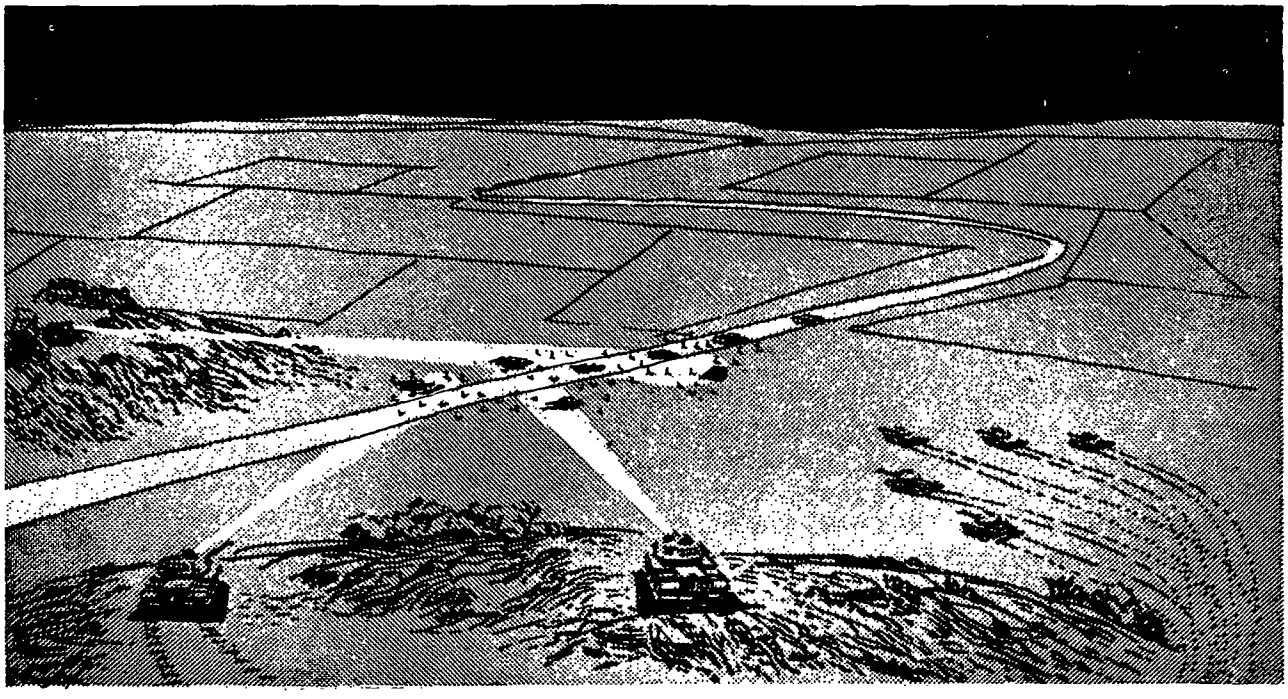


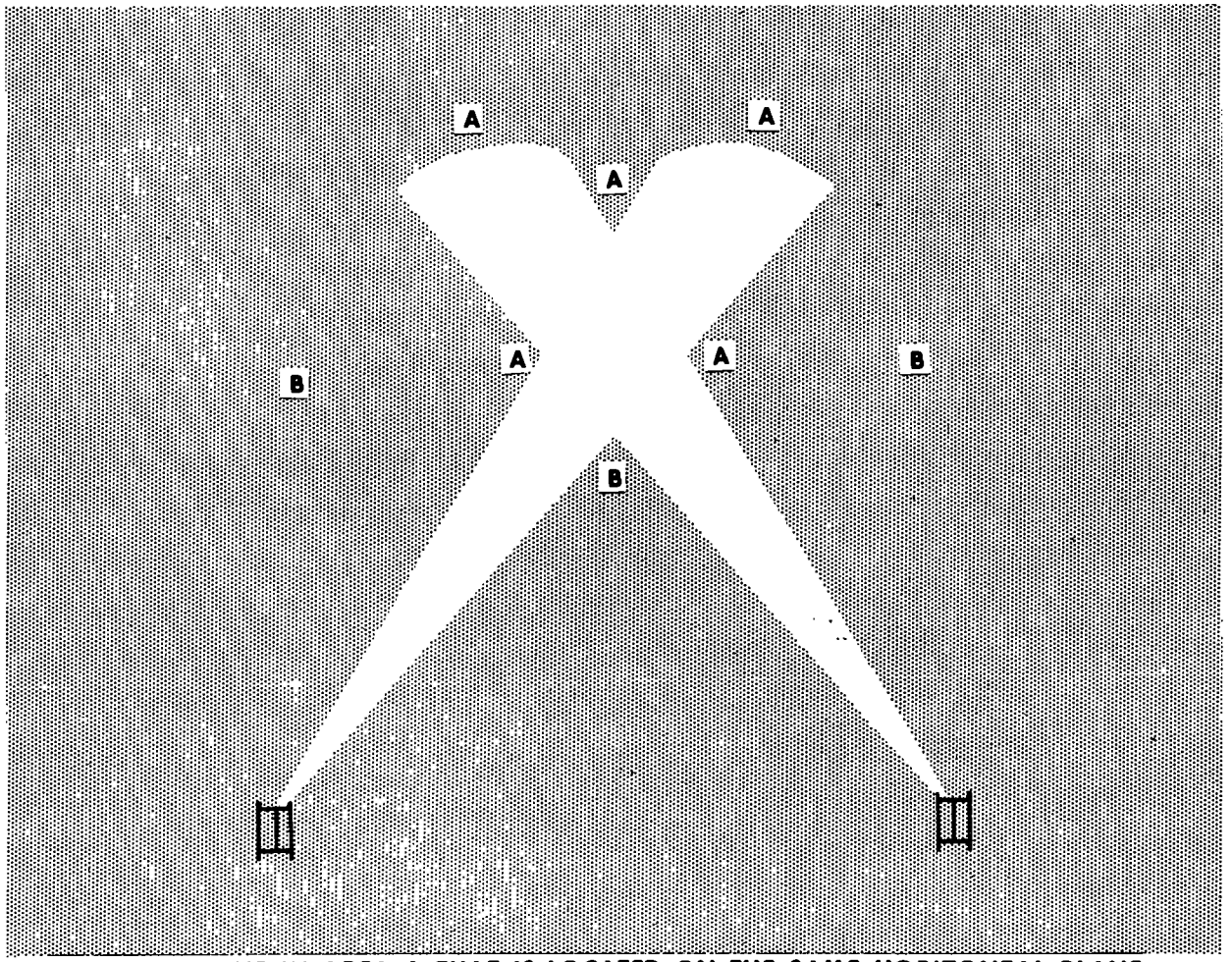
Figure 13–4. Illumination in support of the counterattack.

(12) The use of intersecting searchlight beams to conceal a tactical position is a useful technique. By positioning illuminating tanks on either flank of a position so that the searchlight beams intersect in front of a position, the vision of anyone beyond the beam intersection and in the same horizontal plane as the beam is blocked. Anyone above, below, or to the extreme flank of the lightbeam or between the apex of the beam and the light source can, however, determine the location of the light source. For targets concentrated in one area, such as an enemy counterattack, this technique may be used to conceal friendly locations and blind the enemy. Application of this technique is successful only if the searchlight illumination intensity is greater than that of the enemy's (fig. 13–5).

13–8. Echelons of Forces in the Night Defense

a. For a detailed discussion of establishment of the GOP, LOS, and COP see chapter 12.

b. The battalion scout platoon with attachment of all or part of the battalion surveillance section is particularly well suited for establishing and operating the line of observation and surveillance (LOS). There may be, however, instances when the LOS is provided by the team commander from organic resources. The force required to man the LOS should be equipped with sufficient night observation devices and other surveillance equipment. To detect IR radiation, acquire targets, obtain intelligence, and provide early warning are all tasks included in the mission of the LOS.



NOTE: ANYONE IN AREA A THAT IS LOCATED ON THE SAME HORIZONTAL PLANE AS THE SEARCHLIGHT BEAM WILL BE UNABLE TO OBSERVE THROUGH THE BEAM. ANYONE LOCATED IN AREA B WILL BE ABLE TO PINPOINT THE LIGHT SOURCE.

Figure 13–5. Intersecting beams.

13–9. Reverse Slope Defense

The reverse slope defense is another method of conducting night defensive operations. This may be dictated by a need to achieve maximum surprise and to deceive the enemy as to the true location of friendly defensive positions. It also may be used when engagement ranges are short because of visibility limitations imposed by fog, snow, or other climatic conditions; when the forward slope is made untenable by dominating terrain occupied by the enemy or by enemy fire; or when it is necessary to avoid defending a dangerous salient. Long range engagement of the enemy in this method of defense is not normal; however, short range violent engagements are expected. To be successful, this defense must be based on the element of surprise and strict control of fire and illumination. This is accomplished by provisions for—

a. An effective early warning system.

b. A plan to give the position the appearance of being unoccupied.

c. Well-concealed reverse slope tank positions that facilitate flank engagement of the enemy as he assaults the position.

d. IR from tank-mounted searchlights used for the initial engagement, followed by white light. Additionally, trip flares or field expedient flame illuminators are positioned near the crest of the hill to be activated as the enemy passes the crest. This latter type of illumination is designed to silhouette the advancing enemy.

e. A fire plan that provides fire to strike the rear and flanks of the enemy, to seal off his routes of withdrawal, and to disrupt efforts to reinforce him.

f. A counterattack plan at task force level designed to complete the destruction of the enemy force, strike at reinforcement efforts, or to seize key terrain that facilitates the resumption of the offense.

13–10. Conduct of the Night Defense

As the enemy initiates his attack the GOP, LOS, and COP are withdrawn through the FEBA in succession after accomplishing their missions. They move into the blocking positions or to subsequent missions of flank or rear security. OP/LP and security patrols employed forward of the team's position normally withdraw on order into the position. Concurrently, the enemy is normally engaged by long range artillery and mortar fires as far out from the position as possible, and team positions are placed on a full alert. As the enemy force progresses toward the team blocking positions, the task force commander lifts listening silence and grants permission to the teams to illuminate in accordance with the NVP. Team commanders do not illuminate with organic tank-mounted searchlights until the enemy is within effective illumination and firing range. Ground surveillance radar(s) and night observation devices (NOD) provide data for initial weapon and searchlight orientation before illuminating. Team commanders designate the type illumination to be employed and targets or sectors of responsibility for each platoon. Platoon leaders in turn use fire and flicker illumination techniques to engage the enemy. These actions provide maximum deception for friendly dispositions for extended periods of time. Additionally, they insure that the defender can engage the enemy with maximum fire at the most opportune time to facilitate the complete destruction of his force. Security forces, OP/LP, and patrols are then deployed from the blocking positions and the surveillance and deception plans are reestablished. Casualties are evacuated and replaced. Tanks, infantry, and crew served weapons are repositioned to adjust for losses incurred during the defense of the position. If necessary, ammunition is redistributed until resupply is accomplished. At first light, OP/LP personnel are replaced. Daylight OP's are deployed at greater distances from the position.

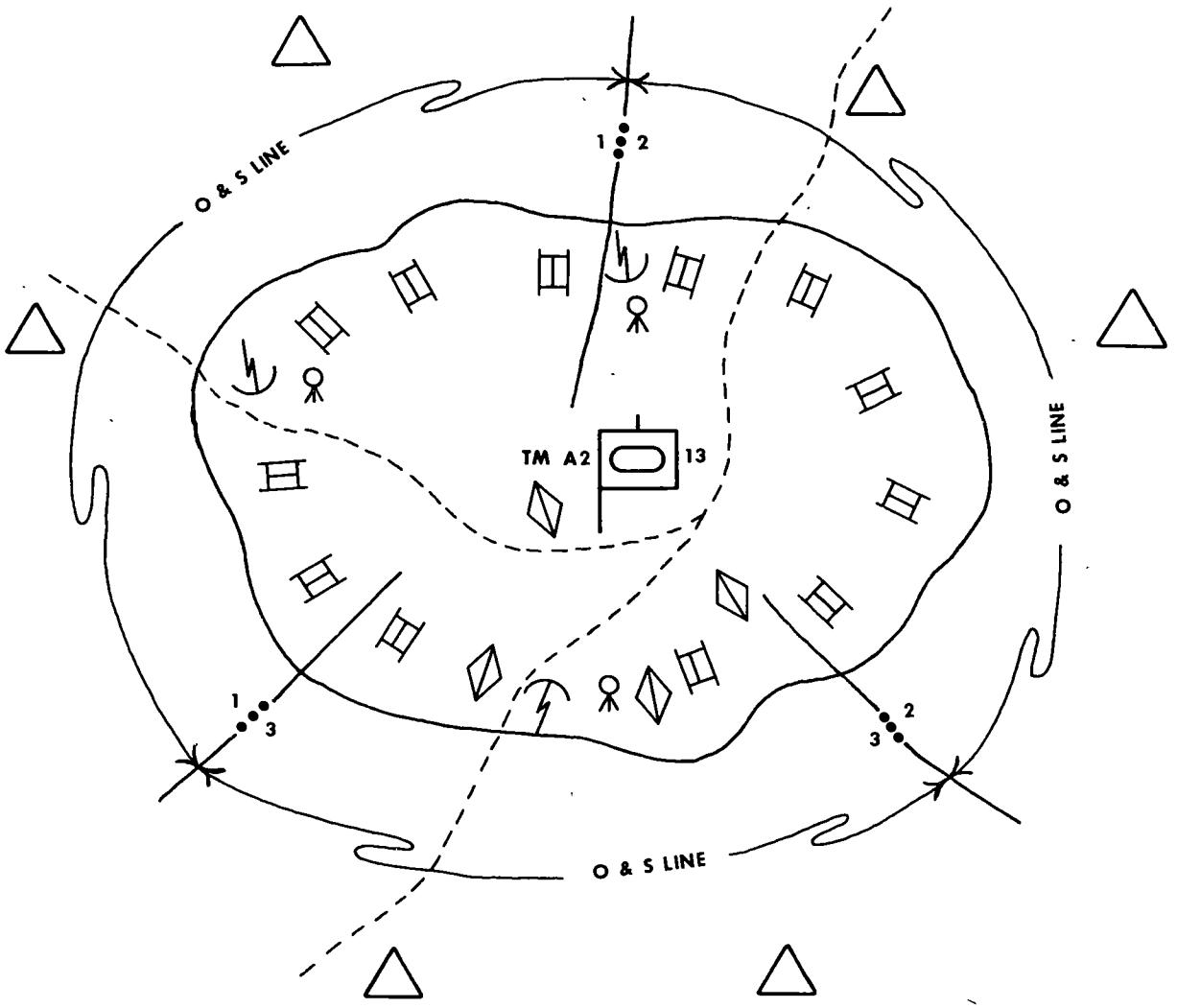
13–11. Night Perimeter Defense

a. Night perimeter defense is required in most combat situations. The perimeter defense may be supported by other maneuver units nearby in similar dispositions or only by artillery fires or tactical air support. An example of such perimeter defense at night is discussed for one of the more difficult operations to execute—the jungle area of operations.

b. The jungle affects conduct of the perimeter defense by restricting observation, fields of fire, movement, and communication. These factors make control extremely difficult. In a dense jungle, troops are disposed along the perimeter with minimum intervals between positions and no gaps between subordinate elements. Security elements consist of small dug-in groups to cover trails and other approaches to the position. Security is established at a distance that will insure detection of the enemy before he closes to effectively employ handheld antitank weapons. When units occupy defensive positions that are supported solely by artillery fires and tactical air support, the need for all-round defense takes on added significance. Every effort is made to establish a perimeter as soon after halting as possible. Particular care is taken to guard against infiltration of the perimeter. When available, anti-intrusion devices are emplaced around the perimeter. The perimeter should be moved short distances after dark to nullify the enemy daylight reconnaissance. If this is impractical, movement of weapons, vehicles, and barrier systems

within the established perimeter is accomplished.

c. Location of targets at night in jungle terrain is extremely difficult due to low ambient light levels, dense foliage, and movement of nocturnal jungle life. Dependence upon radar identification is unreliable unless augmented by the use of night vision devices to visually identify targets located by ground surveillance radars. It is essential to integrate all night operating aids into the night perimeter defense (fig. 13–6).



NOTE: ALL OBSERVATION/LISTENING POST ARE EQUIPPED WITH STARLIGHT SCOPES, AND METASCOPES, OR INFRARED WEAPONS SIGHTS.

Figure 13–6. Night perimeter defense.

d. Tank searchlights are employed in the standard manner; however, terrain and dense foliage reduce the effective range of both visible and infrared illumination.

e. Employment of field expendient flame illuminants surrounding the perimeter clearly defines the limits of the friendly position. This technique is used as a fire coordination measure for artillery and air support to delineate the perimeter boundary and establish adjacent areas outside this boundary as free fire areas. Additional benefits, such as silhouetting infiltrating forces and pinpointing enemy locations for adjustment of mortar, artillery, and tactical airstrikes, are derived from this technique.

f. Infrared and radar detectors, if available, may be used to detect the approach of forces using active IR night vision aids or surveillance radars.

CHAPTER 14

NIGHT DEFENSE OF BASE CAMPS AND FIXED INSTALLATIONS

Section I. GENERAL

14–1. General

The night defense of base camp installations is a perimeter defense as discussed in FM 31–16 and appropriate manuals of the 100-, 7-, and 17- series. The tactics and techniques of night operations as described throughout this manual are also applicable.

14–2. Requirements for Base Camp Areas

In a stability operations environment, permanent and semipermanent secure base areas are established for the following reasons:

a. To facilitate offensive operations.

b. To allow combat support and combat service support activities to be performed with minimum security forces.

c. To protect vital installations, both military and civilian, whose continued functioning is important to the military effort or the civilian economy. Examples are—

(1) Military or police outposts.
(2) Transportation systems.
(3) Power facilities.
(4) Logistical depots.
(5) Essential industries.
(6) Small population groups.
(7) Airfields.

14–3. Basic Considerations

The night defense of base areas is established to provide all-round security for the base with a minimum commitment of available forces. It is characterized by detailed planning and centralized control. Security measures are necessary to safeguard personnel, installations, and equipment. The defense of the base camp is aggressive and offensive in nature in order to prevent the buildup of hostile forces in the area. Vigilance and security measures reduce hostile interference with operations from the base. Fundamentals of the base area defense are—

a. Proper Use of Terrain. Proper evaluation and organization of the area is essential to minimize the forces required for an adequate defense. The natural characteristics of the terrain are improved by artificial obstacles. Consideration is given to the positioning of security elements and surveillance equipment to maximize the effectiveness of available night vision aids and surveillance devices. Night observation posts should be positioned to make maximum use of passive and active night vision equipment. Ground surveillance and countermortar radars should have high priority for position areas. Consideration must be given to existing roads and waterways used for military routes of communication and civilian travel. The control of the terrain surrounding the base complex outward to a distance beyond the range of hostile mortars and to a distance that permits early detection and engagement of an enemy ground threat to the base complex is a desirable and essential requirement.

b. Security. Early warning provides the time required to react to a hostile threat. Techniques to provide sufficient early warning include the use of outposts, observation posts, patrols, sentry dogs, ground surveillance and countermortar radars, anti-intrusion devices, and aerial surveillance.

c. Mutual Support. Defending forces are positioned to insure mutual support in the employment of defensive resources. Requirements for mutual support must consider the circular aspects of the defensive area. Gaps are controlled by surveillance, patrols, obstacles, prearranged fire support, and planned employment of reserve forces. Plans must provide for

use of all available surveillance aids, fire support, and combat forces.

d. All-Round Defense. Plans must provide for a night defense against simultaneous attacks from any direction. Reserves must be positioned to permit reaction to any threat. Surveillance and countermortar radars are positioned to establish maximum all-round coverage. Supplementary radar positions are chosen to fill gaps in surveillance coverage.

e. Defense in Depth. The size of the base area dictates the degree of defense in depth. Depth in the defensive position is best achieved by establishing positions that are staggered and mutually supporting. Outposts, observation posts, and strong points forward of the main defensive positions provide added depth. At night, proper positioning of night vision devices allows greater depth of observation. An effective NVP coordinated with the fire support plan provides for surveillance and fires in depth.

f. Responsiveness. Enemy actions against base areas may range from small arms, sniper, recoilless rifle, rocket, or mortar fires, to attacks by squad sized infiltration and demolition elements, or to a coordinated assault by a major force. The hostile force has the advantage of deciding when and where he will attack. The defender positions his forces, plans fires, and develops security measures to meet the widest range of contingencies. Flexibility at night depends to a great extent on the ability of the reserve force to operate at near daylight capability. This flexibility is obtained by employment of battlefield illumination means and night vision aids.

g. Aggressive Offensive Actions. Hostile forces are cleared from the immediate area of the proposed base camp or fixed installation site. Offensive operations in the vicinity of the site continue while base installations are being constructed and the base area defensive plans developed. A minimum size force is employed to secure the immediate area of the base while the major forces are employed to conduct offensive operations away from the base area to detect and destroy hostile forces and their resources. Aggressive ground and air offensive operations, to include airstrikes and artillery destructive fires, are employed continuously against known or suspected enemy forces and installations. Control of the area of influence and security of the base camp will further be achieved by constant air and ground surveillance and the employment of artillery harassing and interdiction fires.

h. Dispersion. Dispersion is difficult to maintain in the base areas. This problem is partially overcome by using outposts and strong points to deploy defensive forces forward of the actual base area. To further compensate for lack of dispersion, the routine base security measures should be altered frequently to counter the intelligence efforts of the hostile force. Aircraft and other sensitive equipment and materiel are dispersed and protected.

i. Time Available. In formulating the defense plan, the commander considers the time available to prepare defensive positions. Precise timing and careful selection of tasks to be completed are prerequisites to successful conduct of the defense. Planning and improvement continues so long as a base is occupied.

j. Integrated and Coordinated Defensive Measures. Measures required to insure integration and coordination of defensive measures are discussed in (1) through (3) below.

(1) *Fire support.* All available fire support means are employed at night to support the base defense. The capabilities and limitations of the available weapons systems are considered in order to provide flexible all weather fire support under all visibility conditions. Paragraphs 4–9 through 4–16 discuss techniques peculiar to fire support during darkness. FM 6–20–1 and FM 6–20–2 discuss the tactics and techniques of fire support and coordination measures.

(2) *Barrier plans.* Barriers are planned, coordinated, and established to insure minimum interference with units which must shift rapidly for employment in a threatened area. The location of defensive positions and the effect that barriers have on the mobility of friendly forces, particularly in the counterattack, are considered early in the planning sequence. Exploding flame devices and flame expedients are prepared, controlled, and fired by forward elements to create obstacles and pro-

vide illumination. Selected weapons with a relatively short range killing zone should be used in populated areas, in order to minimize hazards to the civilian population. Extensive use of directional mines is incorporated into the defensive system. Natural obstacles are used whenever possible and are supplemented by artificial obstacles. Surveillance radars and anti-intrusion devices are employed to cover gaps and to supplement coverage on principal enemy avenues of approach.

(3) *Night visibility plan (NVP).* A night visibility plan is prepared to coordinate the use of available illumination, night vision, and surveillance means. This plan must be flexible to insure incorporation of measures to meet the changing requirements of the enemy threat and the availability of night vision aids. Maximum use of field expedient flame and illumination means should be considered. The NVP and night vision and surveillance aids are discussed in chapter 3.

14–4. Base Defense Area

The base defense area consists of the base camp, or fixed installation, and the surrounding area. It extends outward to a distance which, if controlled by friendly forces, will prohibit enemy direct fire into the perimeter. The base defense area is composed of a security area, forward defense area, and a reserve area (fig. 14–1). The elements within these areas vary in composition and strength as dicttated by the specific mission; enemy threat; terrain; troops available; location, size, shape, and function of the installation; and its operating personnel. Provisions are incorporated in the base defense plan for the employment of organic, tenant, transient, and host country units.

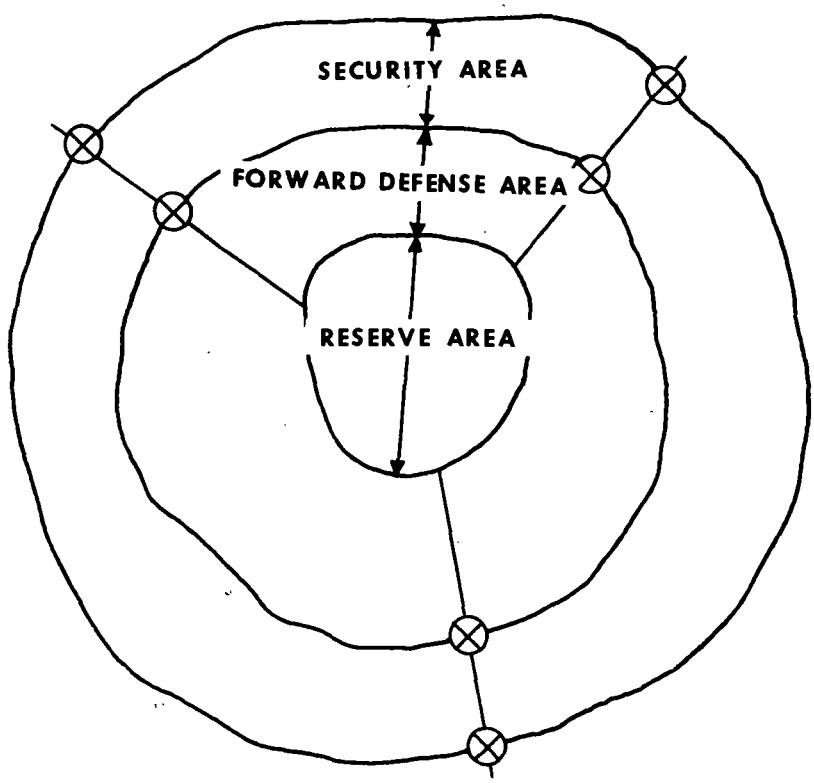


Figure 14–1. Base defense area (schematic).

a. Security Area. The security area extends forward from the positions located along the base perimeter to the distance that the commander determines necessary to employ security forces. These security elements extend to an area that provides early warning, denies close observation, and prohibits enemy direct fire into the perimeter. Security forces are organized with an appropriate balance of available combat arms maneuver and fire support elements equipped with night vision and surveillance devices.

b. Forward Defense Area. The forward defense area consists of the area occupied by the forces along the perimeter to include their immediate reserves. These forces are organized to repel and destroy an enemy assault and to prevent his penetration of the perimeter.

c. Reserve Area. The reserve area is located to the rear of the forward defense area and is generally within the interior of the base area. Those individuals not employed in the security and forward defense areas are assigned a reserve position. In addition, all friendly (host country) forces in the surrounding area are considered reserve forces. In addition to forces regularly assigned as base area reserves, all units and personnel not assigned a security or forward defense mission, are incorporated into the defense plan as reserves whenever they are present in the base camp.

d. Tactical Operation Center (TOC). The base area TOC must be able to control fire and maneuver, and integrate the two into an effective defense. Artillery, tactical air, army aviation, and naval fire support representatives in the TOC along with representatives of the host country, must closely coordinate their functions to provide maximum flexibility and rapidity of response to enemy attacks. Also, liaison should be established with the host country control centers, preferably through assigned U.S. advisors. Coordination becomes extremely critical because of the high population density in most stability operations areas.

Section II. TECHNIQUES OF BASE CAMP DEFENSE AT NIGHT

14-5. Security Area

a. The security area contains observation and security (O&S) groups. These groups are equipped with available night vision devices and surveillance equipment. Observation posts are positioned to take advantage of the capabilities of the night vision aids. Patrols using night vision devices provide security, maintain contact between outposts, and establish ambushes. Intensive patrolling in the security area is effective in eliminating infiltration. Observation and security group locations and patrol areas are frequently changed at random without establishing patterns. Techniques for night patrolling, ambushes, and counterambushes are discussed in chapter 17.

b. A detailed barrier plan reduces the forces required in the security area. Maximum use of natural obstacles is essential. Anti-intrusion devices are effective on avenues of approach and gaps in barriers. Barriers in the security area should be covered by surveillance and must be covered by fire. The short range ground surveillance radar is well suited for use in the security area.

c. Defensive harassing and interdiction fires are effective in support of forces in the security area. Maximum use of available fire support discourages infiltration and destroys attacking enemy forces while covering the activities of friendly elements.

d. Illumination devices such as trip flares, expedient exploding flame devices and flame expedients are effective components of the barrier. Searchlights and artillery (mortar) illumination are employed to expose or harass the enemy. Care is taken to insure that friendly positions are not exposed.

e. Sentry dog teams are especially effective during periods of darkness in the security area. Sentry dogs offset many of the limitations of unaided night vision. The presence of sentry dogs provides psychological advantages over possible infiltrators.

14-6. Forward Defense Area

a. The forward defense area perimeter is occupied by the primary defending force. This force has the mission of destroying the enemy or ejecting him from the defended area. Each

subordinate unit in the forward defense area establishes a reserve. Bunkers, berms, and other semipermanent positions are appropriate but should be moved periodically to confuse attacking forces or infiltrators. Maximum use of active and passive night vision devices is essential for an effective defense and to reduce the manpower requirements for surveillance.

b. Medium range ground surveillance radars are appropriate for employment in the forward defense area. In addition to providing surveillance of enemy activities, these radars may be used to control patrols in the security area. The long range ground surveillance radars may be employed in the forward defense area, or, if positioning and range capabilities permit, in the reserve area.

c. Fire support techniques discussed in paragraphs 4–9 through 4–16 and paragraph 14–5 are applicable. Extensive use of mortars releases artillery for support of offensive operations. The use of preplanned, on-call, radar controlled airstrikes discussed in chapter 4 is particularly appropriate for base defense.

d. Requirements and techniques of illumination discussed above are applicable in support of the forward defense area. The illumination portion of the NVP provides for on-call illumination of the entire area. Illumination is employed only if effective enemy fires are received; otherwise, it sacrifices security, creates confusion, and is, therefore, avoided where possible.

14–7. Reserve Area

The reserve area is normally within the installation or activity that is being secured. In addition to providing a reserve for the external defense, internal security of the installation must be maintained. When reserve forces are committed, internal security must not be sacrificed. Enemy activities that may be conducted within the reserve area include sabotage, terrorism, information collection, ambushes, and sniper activity. All available military and civilian personnel are considered for reserve and internal security forces. Units defending larger or priority installations are augmented by military police units to free elements for offensive operations.

a. Military police units in the performance of their normal night functions are an effective part of any fixed installations reserve and security force. Military police operate with the host country civil and military police and ordinarily perform area security missions for an assigned area of responsibility. When military police elements are provided to assist in the security of a fixed installation, their responsibilities are normally for internal security, local security, and perimeter defense of the installation. Night operations usually require increased military police support to compensate for the limited visibility. For a discussion of the capabilities and organization of divisional and nondivisional military police units, see FM 19–1 and FM 19–2. For a discussion of their employment during night operations, see paragraphs 5–18 through 5–25. Functions which military police elements perform in support of the defense of installations are—

(1) Provision of static and mobile security posts, checkpoints, guard/sentry dog teams, roadblocks, and patrols against enemy infiltration.

(2) Assistance in the extensive information gathering effort inside and around installations.

(3) Provision of local and external security for command and control facilities or other designated property, persons, and areas of security interest.

(4) Personnel identification and movement control within the installation.

(5) Provision of mobile reserves ready to counter surprise guerrilla attacks.

(6) Participation in rear area protection activities.

(7) Establishment of a responsive and effective means of communication and liaison between military and civilian elements.

b. Long range ground surveillance and countermortar radars are employed within the reserve area. Standby aircraft for aerial observation in case of ground or mortar attack are maintained. Reserve forces are equipped with night vision aids to permit minimum reaction time and near daylight effectiveness.

c. Fire support within the reserve area requires detailed planning and coordination. On-

call artillery and mortar fires are planned in the event of an enemy penetration or extensive infiltration. During such a penetration, the entire area should be illuminated to facilitate aerial surveillance and fire support. Munitions and fire support within the reserve area are tightly controlled to maintain security and prevent accidental injury of friendly personnel.

d. Passive defense measures are practiced within the base area. In addition, an effective psychological warfare and civic action program should be established to secure civilian cooperation. Procedures are instituted to insure that all sentry or intelligence reports indicating an attack are fully evaluated. Intelligence indications may include clandestine preparation of supporting positions, movement of weapons or ammunitions, unusual actions or movement of the civilian population, and reports by host country citizens. Other passive defense measures include—

(1) Dispersal of personnel and valuable equipment, such as aircraft.

(2) Construction of revetments around parking or storage areas.

(3) Construction of primary and alternate weapons positions.

(4) Preparation of individual protective emplacements.

(5) Varying the placement of sentries, random use of foot and vehicle patrols, and use of sentry dogs.

14–8. Defense Against Hostile Mortar and Recoilless Rifle Attack

a. When hostile forces are unable to penetrate the base area perimeter in strength, they may infiltrate mortars and recoilless weapons into preplanned and prepared positions within range of the base. Attacks are planned and executed to place a large volume of fire on the base area in order to inflict heavy casualties and destroy equipment. These attacks normally last 10 to 20 minutes, with a large number of rounds being fired. The weapons are normally withdrawn from the area when their mission is completed or the position is discovered.

b. An aggressive plan is required to detect the infiltration of weapons and to locate the firing positions. When formulating the plan for defense against hostile mortar and recoilless rifle attacks, likely firing positions are located, intelligence data is continuously evaluated, reports by indigenous personnel are examined, and the employment of available resources are coordinated. Dispersal of critical locations, use of foxholes with overhead cover, and use of bunkers minimize casualties and damage.

c. Since it is not always possible to establish and maintain a restricted area around the base, intensive patrolling within the security area is necessary to detect infiltration of hostile mortar and recoilless rifle teams. Combat patrols, in conjucntion with outposts which change locations each night, prevent the hostile force from planning or preparing firing positions within range of the base area.

d. Techniques for preparing a detailed countermortar plan are discussed in paragraphs 4–9 through 4–16. This plan includes the use of countermortar radar, security elements, crater analysis, aircraft, and surveillance equipment for detection purposes. In addition, it includes the use of all available fire support means to deter and destroy mortar and recoilless rifle positions.

PART FIVE

NIGHT RETROGRADE OPERATIONS

CHAPTER 15

GENERAL

15–1. Introduction

A retrograde operation is a movement to the rear or away from the enemy, and can be conducted during the day or at night. Battlefield illumination means, and night vision and surveillance devices facilitate movement, coordination between units, command and control, and fire control of forces executing a retrograde action. Retrograde is an operation associated with relinquishing terrain to the enemy's control. Such an operation may be forced by enemy action or executed voluntarily. In either event the operation must be approved by the higher commander. A retrograde action may be conducted by ground or air movement.

15–2. Purposes

Retrograde operations are conducted for the purpose of maintaining the integrity of forces in order to resume the offensive at some future time under more favorable conditions. In addition, retrograde operations are conducted for one or more of the following reasons:

a. To harass, exhaust, resist, delay, and inflict punishment on the enemy.

b. To draw the enemy into an unfavorable situation.

c. To permit use of elements of the force elsewhere.

d. To avoid combat under undesirable conditions.

e. To gain time and avoid fighting a decisive engagement.

f. To disengage from battle.

g. To conform to movements of friendly troops.

h. To shorten lines of communication.

15–3. Types of Retrograde Operations

Retrograde operations are classified as one of three basic types—

a. Withdrawal—an operation in which all or a part of a deployed force disengages from the enemy.

b. Delaying Action—an operation in which a unit under enemy pressure trades space for time while inflicting maximum punishment on the enemy without becoming decisively engaged.

c. Retirement—an operation in which a force not in contact moves away from the enemy.

15–4. Basic Considerations

a. Retrograde operations are usually more difficult to control than other operations, particularly if conducted during periods of darkness. Proper use of illumination means, night vision, and surveillance devices are incorporated early in the planning. Retrograde operations are characterized by detailed centralized planning and decentralized execution. Plans, orders, and coordination are accomplished in sufficient detail to provide subordinate commanders and understanding of the scheme of maneuver, fire support plan, deception plan, plans for civilian refugee control, and the night visibility plan. Effective control and coordination are accomplished by the use of delay lines, phase lines, lateral boundaries, checkpoints, assembly areas and delay positions, times and routes of movement, and provisions for positive traffic control. Combat service support plans are made to insure that adequate materiels are on each position, these plans must also provide for the disposition of excess supplies and equipment. It is mandatory for commanders at all echelons to be thoroughly familiar with the concept of the operation, and

positioned at critical points to insure effective execution of the retrograde.

b. In order to maintain freedom of action, the force conducting a retrograde movement must avoid decisive engagement unless required to accomplish the mission. The enemy may be expected to strike a withdrawing force from any direction. To counter such an eventuality commanders place particular emphasis on gap coverage, flank, front, and rear security. Measures are coordinated to prevent enemy ground or airborne encirclement. Provisions must be made to move rapidly under the protection of mobile security forces which maintain contact with the enemy.

c. Terrain is analyzed to determine its advantageous aspects. Areas that provide long range observation and fields of fire, permit engagement of the enemy at maximum ranges forward of the retrograde force's positions, and delays or restricts the enemy's maneuver. Concealment and cover are sought when selecting assembly areas, delay positions, and withdrawal routes. The identification and control of key terrain insures security to the moving elements and limits the enemy ability to interfere with the retrograde force. Road nets are exploited, especially by mechanized and motorized forces, to expedite movement and facilitate control. Proper use of natural and artificial obstacles enhances effective conduct of the withdrawal and restricts the enemy's advance. Forces are positioned and fire plans developed to deny and impede the enemy's use of avenues of approach. Unfavorable weather conditions may restrict observation, reduce the effects of nuclear fires, restrict traffic, influence the efficiency of personnel and equipment, and increase the problems of command and control. The commander who effectively evaluates the military aspects of terrain and the influence of weather on the retrograde action can achieve decisive results over a numerically superior enemy.

d. Airmobile units have the capability of supporting all types of night retrograde operations. The extraction of a force conducting a night retrograde movement under enemy pressure requires detailed planning and coordination of flight routes, pickup zones, recognition signals, supporting fires, and aircraft loading plans. The repositioning of forces by airmobile means at night to assist a retrograde element in contact with the enemy provides the tactical advantage of rapid massing of combat power at a point of decision.

e. Night vision and surveillance devices to a large degree remove the previous distinctions between daylight and night retrograde operations. It is difficult to conceal a retrograde operation from enemy aircraft equipped with night surveillance devices. For this reason, the mobility differential between the friendly and enemy forces is a principal consideration when planning a retrograde action. The rate and accuracy of movement of a retrograde force is greatly facilitated by the utilization of night vision devices and land navigational aids.

15–5. Types of Forces

a. All armor and infantry elements and their normal combat support units are able to conduct night retrograde operations.

b. The tactical mobility and long range fires of armor coupled with capabilities of the mechanized infantry to retain terrain, employ firepower, communicate, and move by organic means makes these units particularly suited for night retrograde operations. The employment of these forces with supporting artillery, engineer, and signal units, all utilizing battlefield illumination, night vision devices, and surveillance devices, increases the effectiveness of retrograde operations.

c. Usually a force engaged in retrograde operations is weaker than the enemy. Therefore, the skillful and aggressive use of artillery and tank firepower is employed to take the enemy under fire at maximum ranges and to force his early deployment. Artillery initially is positioned well forward to exploit the range of its weapons. Detailed plans for the displacement and security of artillery units is developed to provide continuous indirect fire support for the forces moving to the rear.

d. Engineer units are employed to execute barrier plans, construct obstacles and rearward positions, maintain roads, and destroy bridges.

e. Signal units are employed to supplement organic communication means. Early displacement of signal facilities to the rear areas insures continuous maintenance of communications with the elements in position and on the move.

CHAPTER 16

NIGHT RETROGRADE OPERATIONS

Section I. WITHDRAWAL

16–1. General

a. A withdrawal is a retrograde operation in which all or part of a deployed force disengages from the enemy to initiate some other action. It may be executed during either the hours of darkness or daylight. There are two types—the voluntary withdrawal and the involuntary withdrawal. The voluntary withdrawal is preferred, because it is conducted without enemy pressure. The voluntary withdrawal is conducted to deceive the enemy. This is accomplished by having units move with secrecy applying techniques that keep the withdrawal hidden from enemy observation. An involuntary withdrawal is conducted under enemy pressure.

b. The greater the mobility and long range firepower of a unit, the better its capability for conducting a successful involuntary withdrawal. The mobility, protection, and long range firepower of tank, armored cavalry, and mechanized units enable them to conduct involuntary withdrawals with greater success than other units.

16–2. Night Voluntary Withdrawal

a. The success of a night voluntary withdrawal depends primarily on secrecy and deception. Troops and weapons withdraw and assemble as quietly as possible. Detachments left in contact protect and conceal the withdrawal of the main body. They simulate the normal activities of the unit by maintaining their normal fires, patrolling, and other deceptive means. In preparation for a voluntary withdrawal, the commander prescribes guidance in the night visibility plan for the employment of battlefield illumination means and use of night vision and surveillance devices.

b. Voluntary withdrawals are conducted with detachments left in contact (DLIC) and with or without a covering force deployed to the rear of the forward elements. The commander conducting a voluntary withdrawal at night divides the command into a main body and a DLIC.

c. DLIC normal composition includes—

(1) One-third of the maneuver elements and one-half of the organic supporting weapons of the forward committed companies.

(2) Tanks located in the areas of the forward committed companies if an enemy tank threat exists, or if the movement of tanks to the rear would disrupt the deception.

(3) One-half the supporting weapons of the battalion, brigade, and division.

(4) One-half of the organic night vision and surveillance devices.

(5) Sufficient command and control elements and combat service support elements.

d. The commander conducting a voluntary withdrawal may elect to provide a covering force for the withdrawal. In this case—

(1) DLIC are provided by the forward elements. They provide cover for the main body as it assembles and moves to the rear.

(2) Even though a DLIC is provided by forward battalions a higher headquarters may provide a covering force in the voluntary withdrawal. This covering force may be provided by corps, division, or brigade, and it is normally constituted from the reserve echelon of the command providing the covering force. Whether a level of command does or does not provide a covering force depends on the availability of forces, the time available, the suitability of terrain, the enemy's attack capability, and if the higher command has provided

a covering force. Normally, in the voluntary withdrawal, if a higher command has provided a covering force, the subordinate command does not establish a covering force.

e. The security of the main body is provided by the DLIC covering their withdrawal and by the DLIC simulating the normal night activities of the command to deceive the enemy. The deception may be made effective by the use of fires to cover the noise of movement and to divert the enemy's attention. Screening forces are provided to cover the withdrawal of the DLIC and to maintain awareness of the location and activities of the enemy. Aircraft equipped with night surveillance devices also assist in maintaining contact with the enemy. If no covering force has been provided for the withdrawal, the screening elements are normally the reserves of the DLIC. They perform a screening mission forward of the next rearward position. If a covering force has been provided, the security elements are normally from the covering force and perform a screening force mission forward of the covering force position. Provision must be made for the security of forces during their rearward movement and for security of the next rearward position or area to be occupied.

f. Plans must include provisions for the possibility of detection by the enemy and interference with the withdrawal operation. If a voluntary withdrawal is discovered, and the enemy attacks, the withdrawal normally continues and is conducted as an involuntary withdrawal. Illumination is planned to support the operation, in the event secrecy is lost. Enemy interference by airborne force envelopment must be anticipated. The commander plans for and uses control measures to facilitate coordination and control of the withdrawal.

g. In order to understand the coordination and control of withdrawing forces, it is necessary to understand the sequence of withdrawal. Because of the requirement for centralized detailed planning, knowledge by all commanders of the sequence is essential since its execution is generally decentralized. The sequence of a voluntary withdrawal is explained in (1) through (7) below, and depicted in figures 16–1 through 16–5.

(1) Portions of the trains and rear installations usually precede the main body to the rear, followed by any excess vehicles. They may move by infiltration during daylight or shortly after dark, but ahead of the main body.

(2) The reserve may be withdrawn as a unit prior to the main body of the forward element or at the same time as the main body of the forward element or, if the commander anticipates pressure from the enemy, he may retain the reserve in position until the main body of the forward elements has passed behind the reserve positions. The reserve normally does not leave elements on position as DLIC from their own reserve.

(3) All elements of the forward units are not designated as DLIC normally begin the withdrawal simultaneously. The time that these elements leave their positions is the *effective time of withdrawal.*

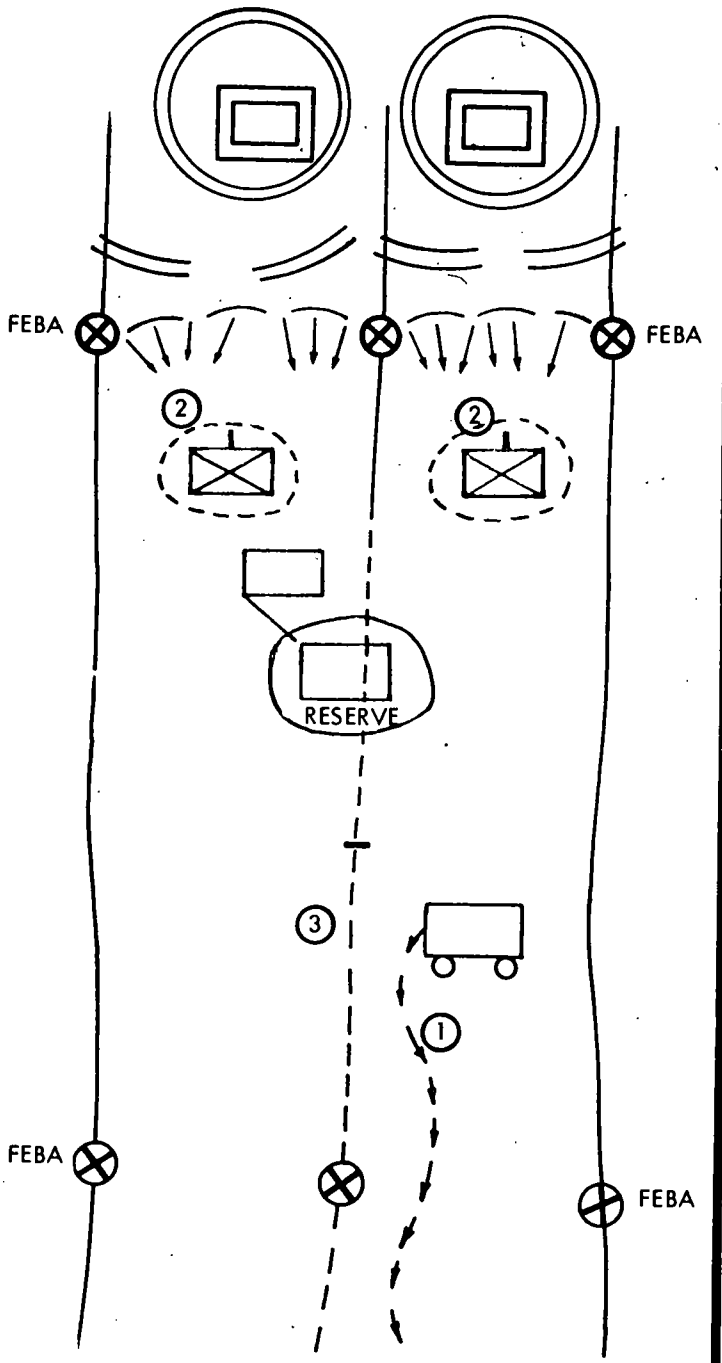
(4) Artillery and 4.2-inch mortars supporting the operation remain in position to support the initial stages of the withdrawal. As soon as the main force is formed for movement, approximately one-half of the artillery and mortars displace to the rear with the main force. The remaining artillery and mortars stay in position to support the DLIC.

(5) If the main body moves to the rear on one route then the commander designates a rear guard to secure the movement. If the elements of the forward committed forces move on separate routes then each commander provides his own rear guard.

(6) The DLIC begin withdrawal simultaneously as directed by higher headquarters. If the higher headquarters is not covering the withdrawal or has not designated an element of the covering force to relieve the reserve of the DLIC and maintain contact with the enemy, then the reserve of the DLIC is normally left on position to maintain an awareness of the location and activities of the enemy (screening force operation).

(7) If no enemy tank threat exists, tanks may be moved to the rear by infiltration during daylight.

h. The main body and DLIC may be extracted by airmobile means during a volun-



SEQUENCE OF A VOLUNTARY WITHDRAWAL

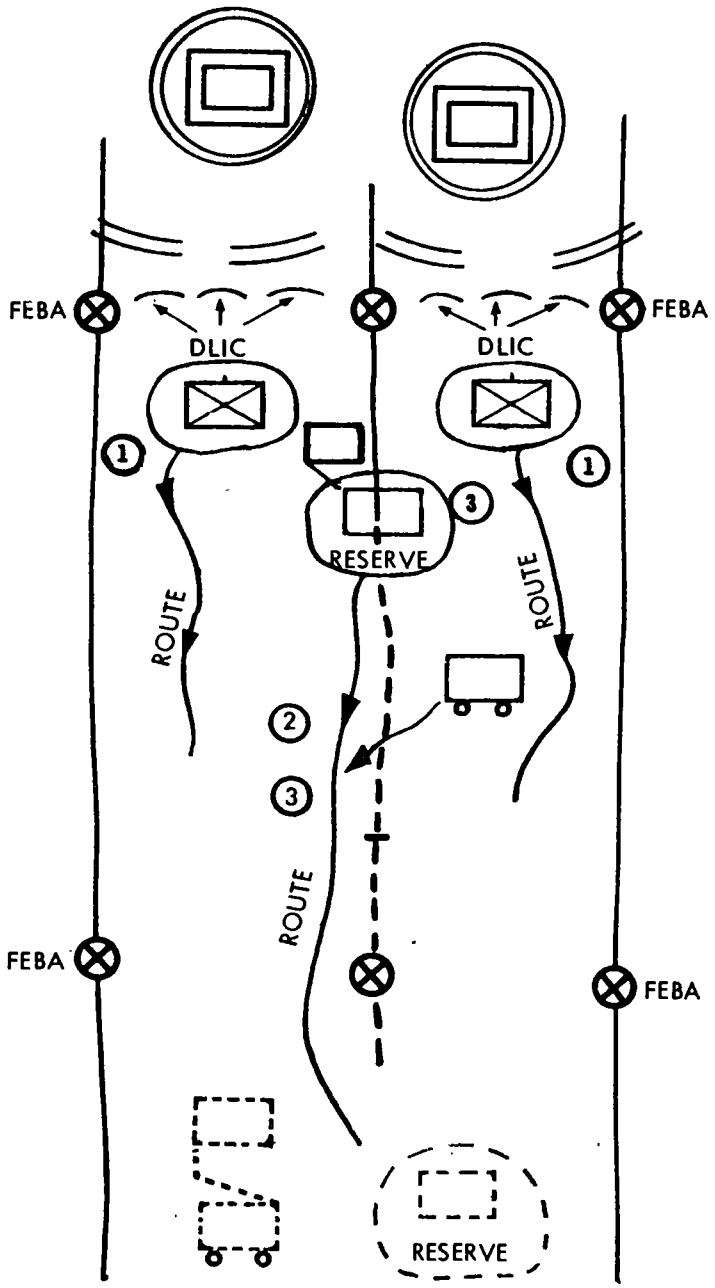
NOTES

(1) PRIOR TO THE EFFECTIVE TIME OF THE WITHDRAWAL SOME VEHICLES MAY HAVE BEEN INFILTRATED TO THE REAR.

(2) AT THE TIME DESIGNATED AS THE EFFECTIVE TIME FOR THE WITHDRAWAL, THE MAIN BODY OF THE FORWARD UNITS LEAVES ITS POSITION AND MOVES TO THE REAR INTO ASSEMBLY AREAS.

(3) THE COMMANDER MAY ELECT TO WITHDRAW HIS RESERVE UNIT BEFORE, DURING, OR AFTER THE WITHDRAWAL. NORMALLY THE RESERVE UNIT DOES NOT FURNISH A DLIC EXCEPT AT FORWARD COMPANY LEVEL.

Figure 16–1. Initial event in the sequence of a voluntary withdrawal.



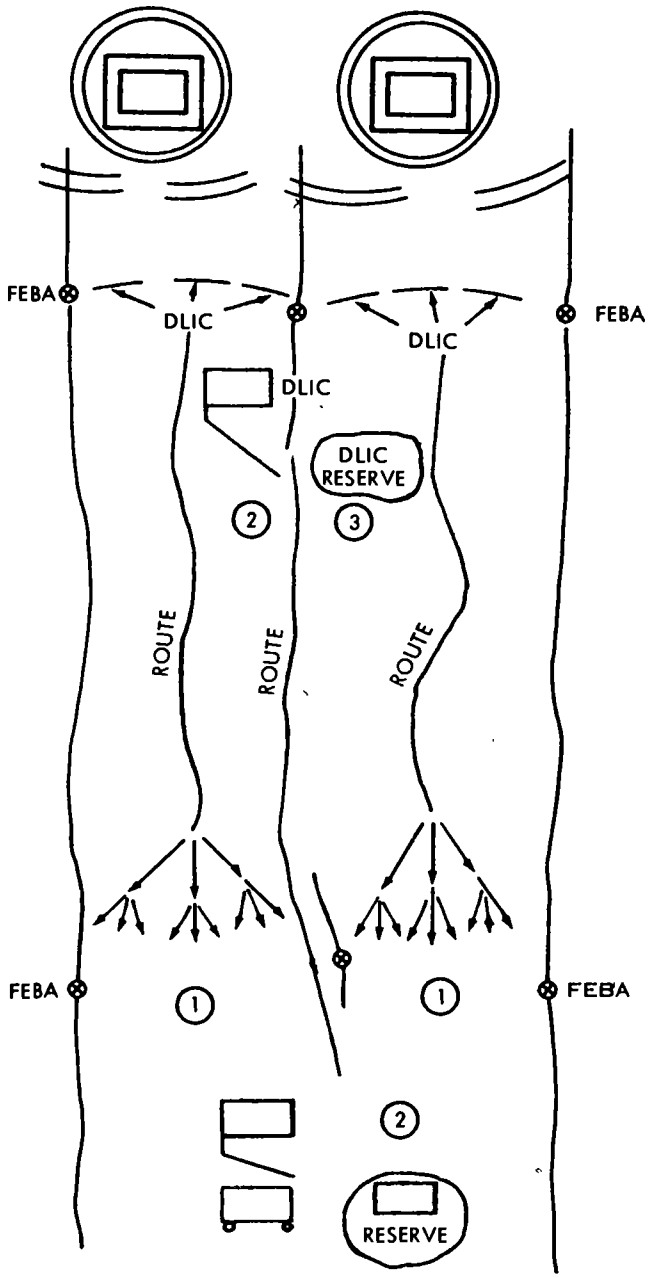
NOTES

(1) THE MAIN BODY OF THE FORWARD UNITS MOVE TO THE REAR LEAVING THE DETACHMENTS LEFT IN CONTACT TO DEFEND THE BATTLE AREA. THE MAIN BODY ASSEMBLES IN ACCORDANCE WITH PREARRANGED PLANS AND MOVES TO THE REAR ON PREDESIGNATED ROUTES.

(2) IN THIS SITUATION THE COMMANDER ELECTED TO WITHDRAW HIS RESERVE AT THE SAME TIME AS THE MAIN BODY OF THE FORWARD UNITS.

(3) THE RESERVE MOVES TO THE REAR, AS DO ELEMENTS OF THE TRAINS AND COMMAND POST NOT SUPPORTING THE DLIC.

Figure 16–2. Second event in the sequence of a voluntary withdrawal.



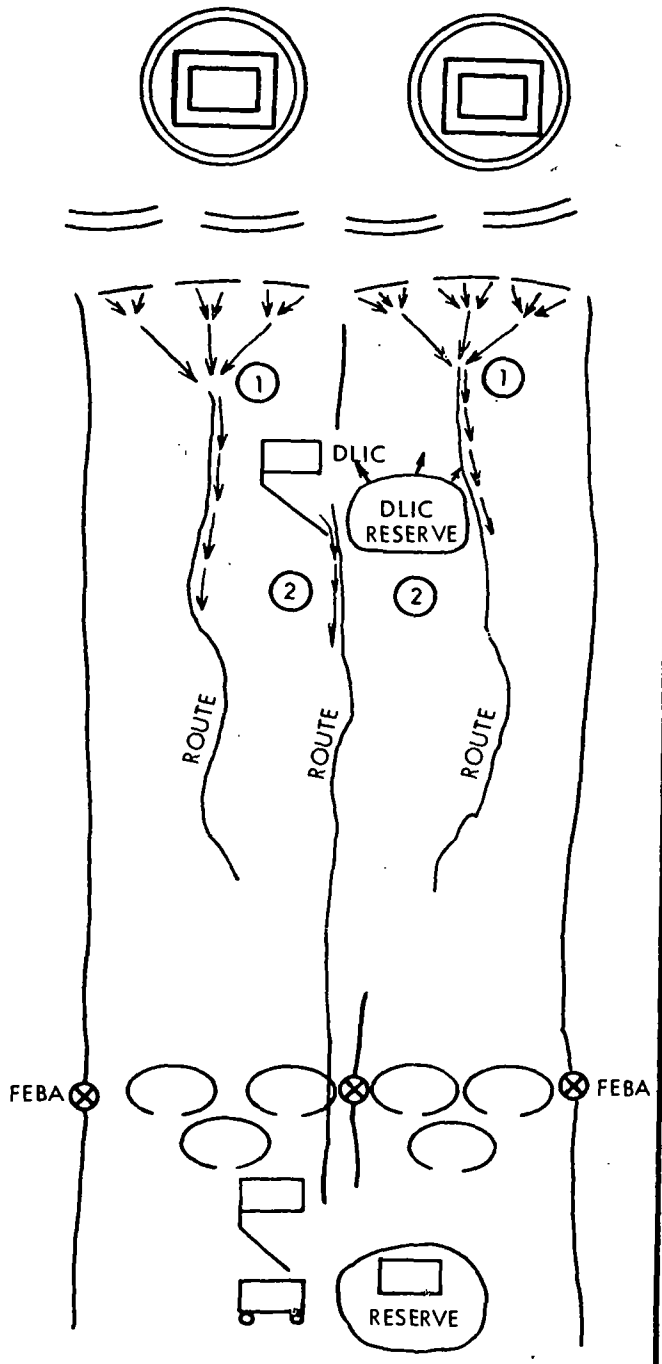
NOTES

(1) THE MAIN BODY OCCUPIES THE FEBA OF THE NEW POSITION. NORMALLY THE NEW POSITION WOULD HAVE BEEN ORGANIZED BY A PARTY SENT TO THE REAR PRIOR TO THE WITHDRAWAL.

(2) THE RESERVE MOVES TO THE REAR AS DO ELEMENTS OF THE TRAINS AND COMMAND POST LEAVING SUFFICIENT PERSONNEL AND EQUIPMENT TO ENABLE THE COMMANDER OF THE DLIC TO EXERCISE COMMAND AND CONTROL.

(3) THE COMMANDER OF THE DLIC NORMALLY CONSTITUTES A RESERVE FROM THE FORCES ALLOCATED TO DLIC. HE CONDUCTS THE DEFENSE OF THE BATTLE AREA. HE IS RESPONSIVE TO THE ORDERS OF THE CO DLIC OF THE NEXT HIGHER UNIT.

Figure 16–3. Third event in the sequence of a voluntary withdrawal.

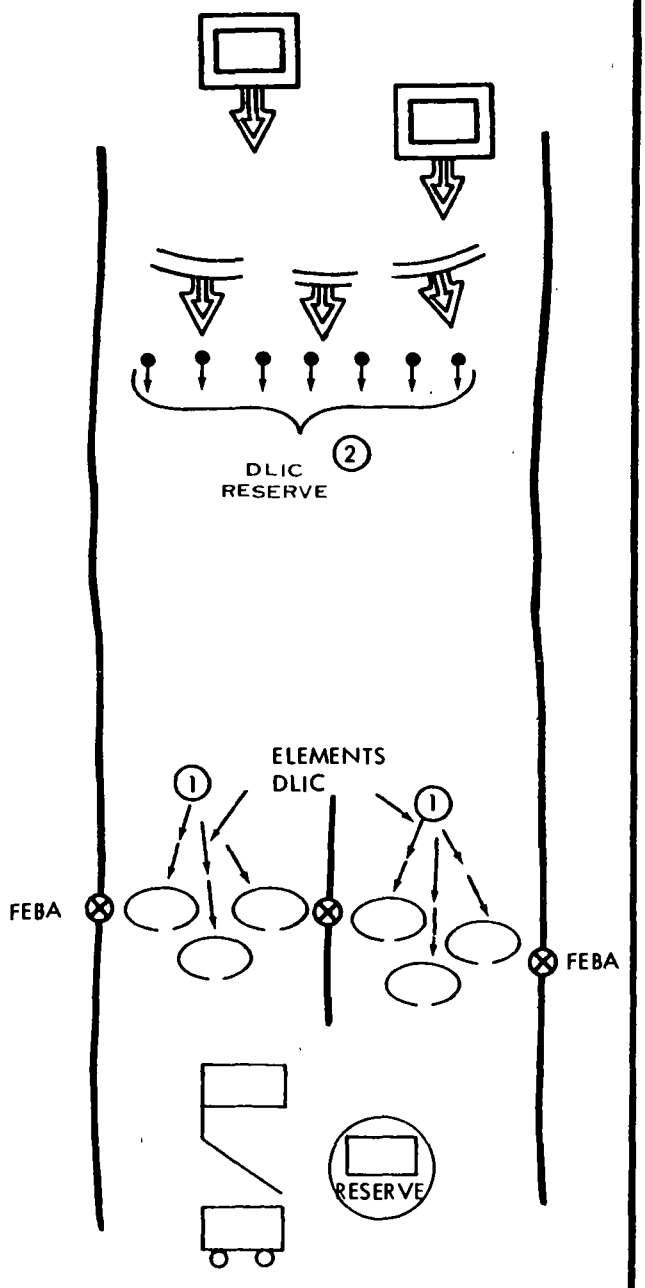


NOTES

(1) ON ORDER OF THE COMMANDER OF THE DLIC, HIGHER HEADQUARTERS, THE DLIC WITHDRAWS, NORMALLY USING THE SAME ROUTES & ASSEMBLY AREA AS DID THE MAIN BODY, AND MOVES TO THE REAR.

(2) THE COMMAND ELEMENT DLIC MOVES TO THE REAR. THE DLIC RESERVE DEPLOYS AND COVERS THE WITHDRAWAL OF THE DLIC. IF A COVERING FORCE HAD BEEN PROVIDED BY HIGHER HEADQUARTERS, THE RESERVE OF THE DLIC WOULD WITHDRAW AS THE LAST ELEMENT OF THE DLIC. SIMULTANEOUSLY RECONNAISSANCE AND SECURITY ELEMENTS FROM THE COVERING FORCE WOULD MOVE FORWARD AND ESTABLISH CONTACT WITH THE ENEMY.

Figure 16–4. Fourth event in the sequence of a voluntary withdrawal.



NOTES

1 THE DLIC WITHDRAWS AND MOVES TO THE REAR REJOINING THE MAIN BODY WHICH IS ALREADY DISPOSED ON THE FEBA.

2 SINCE NO HIGHER HEADQUARTERS PROVIDED A COVERING FORCE FOR THIS OPERATION, THE RESERVE DLIC DEPLOYS AND MAINTAINS CONTACT WITH THE ENEMY; EXECUTING A WITHDRAWAL THROUGH A REARWARD POSITION AS IT CLOSES ON THE FEBA. IF A COVERING FORCE HAD BEEN PROVIDED BY HIGHER HEADQUARTERS, THAT COVERING FORCE WOULD HAVE MAINTAINED CONTACT WITH THE ENEMY.

Figure 16–5. Last event in the sequence of a voluntary withdrawal.

tary withdrawal, providing that the requirements for secrecy, deception, and the simulation of normal night activities are considered. Night navigational and vision aids must be employed to facilitate airmobile operations during the voluntary withdrawal. When conducting a withdrawal by air, the maximum size force, consistent with the number of aircraft available and the size of the pickup zone, should be left for the last lift. The last lift should also contain several spare aircraft to insure adequate lift capability to extract the DLIC.

16–3. Involuntary Withdrawal

a. Since the involuntary withdrawal is executed under enemy pressure, the commander may not have the opportunity to distribute or organize his forces specifically for the withdrawal operation. Elements located in the areas of major subordinate units are normally attached to these units prior to the initiation of the withdrawal. DLIC are not employed in involuntary withdrawals; the forward elements may or may not be covered by one or more covering forces deployed to their rear. Any level of command may be divided into a main body and a covering force for the involuntary withdrawal; however, the provision of a covering force by each level of command is not always feasible. The commander may elect to withdraw his forward force behind a covering force established by a higher level of command and not provide a covering force of his own. If higher level of command has not provided a covering force the commander may elect to establish his own covering force or direct that subordinate commanders provide their own covering force. Figure 16–6 depicts techniques of withdrawal with and without a covering force.

b. The tactical considerations used to determine whether or not a covering force should be employed at a particular level of command are the same for a voluntary and involuntary withdrawal (para 16–2*d*). The commander, in his planning, must consider the possibility that the covering force, if provided, may not be in position, or may not be able to affect disengagement from the enemy. During the involuntary withdrawal, some forces may become decisively engaged and be unable to withdraw without accepting excessive casualties. A commander may assist a subordinate element to disengage by—

(1) Generating additional combat power in support of the decisively engaged elements by allocation of available support fires.

(2) Providing additional forces to the decisively engaged element.

(3) Committing the reserve in a counterattack to assist in the disengagement. A terrain objective is not selected for the counterattacking force since this force attacks through the enemy and is then withdrawn.

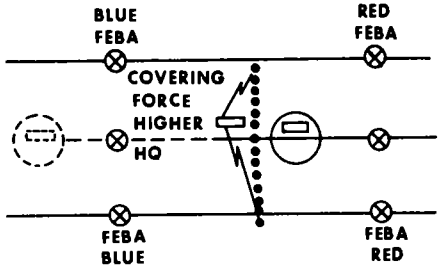
c. The covering force provides security for the main body. Security provisions must be made for the main body during movement, and while securing the next position.

d. The requirement for centralized detailed planning exists as it does in the voluntary withdrawal. Tactical and movement control measures used in the involuntary withdrawal, may vary with the level of command, but are the same measures as those employed in the voluntary withdrawal. Because the involuntary withdrawal is conducted under enemy pressure, its sequence provides more flexibility than does the sequence of the voluntary withdrawal. The sequence of an involuntary withdrawal is explained in (1) through (3) below, and depicted in figures 16–7 through 16–10.

(1) Forward committed units withdraw simultaneously in zone under cover of all available fires in an attempt to break contact with the enemy. When simultaneous withdrawal is not practical, the commander must determine the order of withdrawal. Withdrawing the most heavily engaged units first from the areas of greatest enemy pressure may subject major elements of the command to encirclement and destruction. Withdrawing the least heavily engaged units first may result in loss of all or a major portion of the most heavily engaged units. The decision must be based on a determination of which alternative best insures the accomplishment of the mission.

(*a*) The reserve or elements of the reserve, as designated, prepare to assist in dis-

FIG A

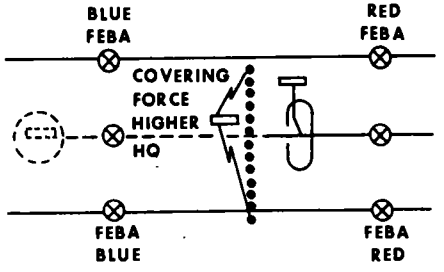


SITUATION· A COVERING FORCE HAS BEEN PROVIDED BY HIGHER HEADQUARTERS

MISSION EXECUTE INVOLUNTARY WITHDRAWAL FROM POSITION RED TO POSITION BLUE

EXPLANATION OF MANEUVER: COMMAND WITHDRAWS, FORWARD ELEMENTS WITHDRAWING IN ZONE BEHIND HIGHER HEADQUARTERS COVERING FORCE AND OCCUPIES POSITION BLUE RESERVE OF COMMAND - - (DOES NOT COVER WITHDRAWAL FORWARD ELEMENTS) -- OCCUPIES ASSEMBLY AREA POSITION BLUE.

FIG B

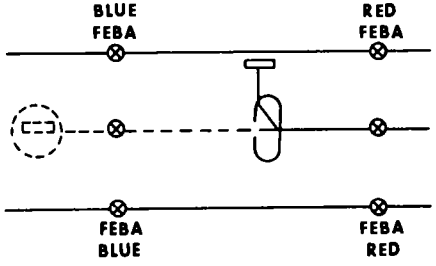


SITUATION A COVERING FORCE HAS BEEN PROVIDED BY HIGHER HEADQUARTERS

MISSION· EXECUTE INVOLUNTARY WITHDRAWAL FROM POSITION RED TO POSITION BLUE.

EXPLANATION OF MANEUVER: COMMAND WITHDRAWS, FORWARD ELEMENTS WITHDRAWING IN ZONE BEHIND COVERING FORCE PROVIDED BY RESERVE, AND OCCUPIES POSITION BLUE. RESERVE OF COMMAND COVERS WITHDRAWAL OF FORWARD ELEMENTS. DELAYS (OR SCREENS) FORWARD OF HIGHER HEADQUARTERS COVERING FORCE WITHDRAWS THROUGH HIGHER HEADQUARTERS COVERING FORCE. OCCUPIES ASSEMBLY AREA POSITION BLUE.

FIG C

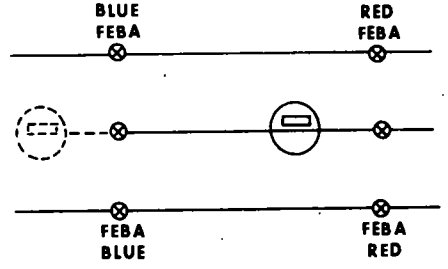


SITUATION: NO COVERING FORCE HAS BEEN PROVIDED BY ANY HIGHER HEADQUARTERS

MISSION EXECUTE INVOLUNTARY WITHDRAWAL FROM POSITION RED TO POSITION BLUE.

EXPLANATION OF MANEUVER: COMMAND WITHDRAWS, FORWARD ELEMENTS WITHDRAWING IN ZONE BEHIND COVERING FORCE PROVIDED BY RESERVE, OCCUPIES POSITION BLUE RESERVE OF COMMAND COVERS WITHDRAWAL OF FORWARD ELEMENTS -- DELAYS (OR SCREENS) FORWARD OF POSITION BLUE. OCCUPIES ASSEMBLY AREA POSITION BLUE.

FIG D



SITUATION NO COVERING FORCE HAS BEEN PROVIDED BY ANY HIGHER HEADQUARTERS.

MISSION: EXECUTE INVOLUNTARY WITHDRAWAL FROM POSITION RED TO POSITION BLUE.

EXPLANATION OF MANEUVER· COMMAND WITHDRAWS, FORWARD ELEMENTS WITHDRAW IN ZONE TO POSITION BLUE, OCCUPIES POSITION BLUE. RESERVE OF COMMAND -- (DOES NOT COVER WITHDRAWAL OF FORWARD ELEMENTS) -- OCCUPIES ASSEMBLY AREA POSITION BLUE

Figure 16–6. Techniques of covering involuntary withdrawals (schematic).

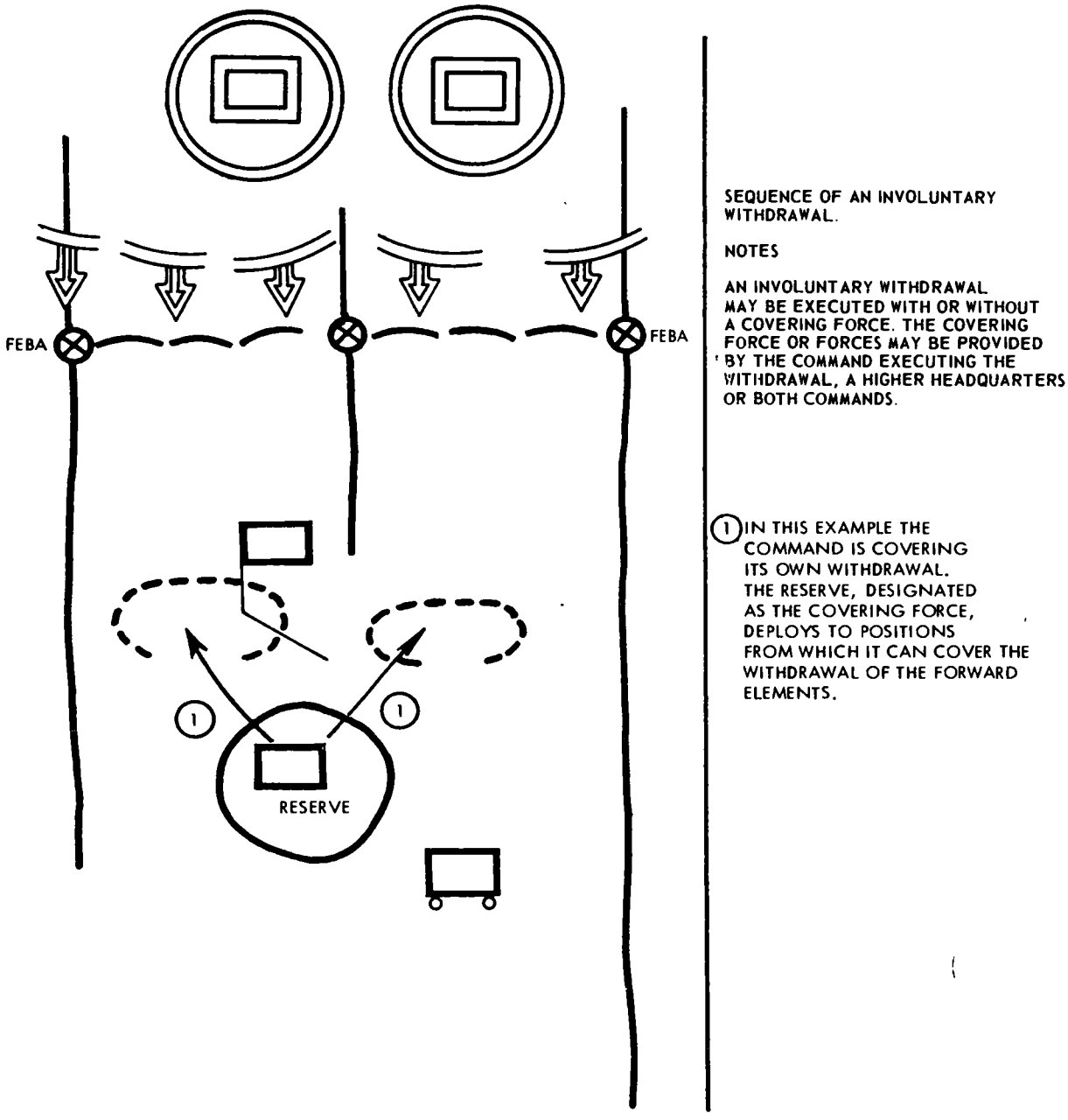


Figure 16–7. Initial event in the sequence of an involuntary withdrawal.

engaging forward committed elements, and/or cover their withdrawal.

(*b*) Trains, CP, and rear installations move to the rear.

(*c*) Artillery and 4.2-inch mortars support the withdrawal initially from present positions and then displace by firing elements to provide continuous support to the command.

(2) As the forward committed elements withdraw through the covering force (if one has been provided) they assemble and move along designated routes to the next position.

(3) The covering force (with fire support and command control elements) maintains con-

tact with the enemy and executes a continuous delay. Alternatively it may act as a screening force without becoming decisively engaged forward of the next position or until it passes through a covering force of the next higher command.

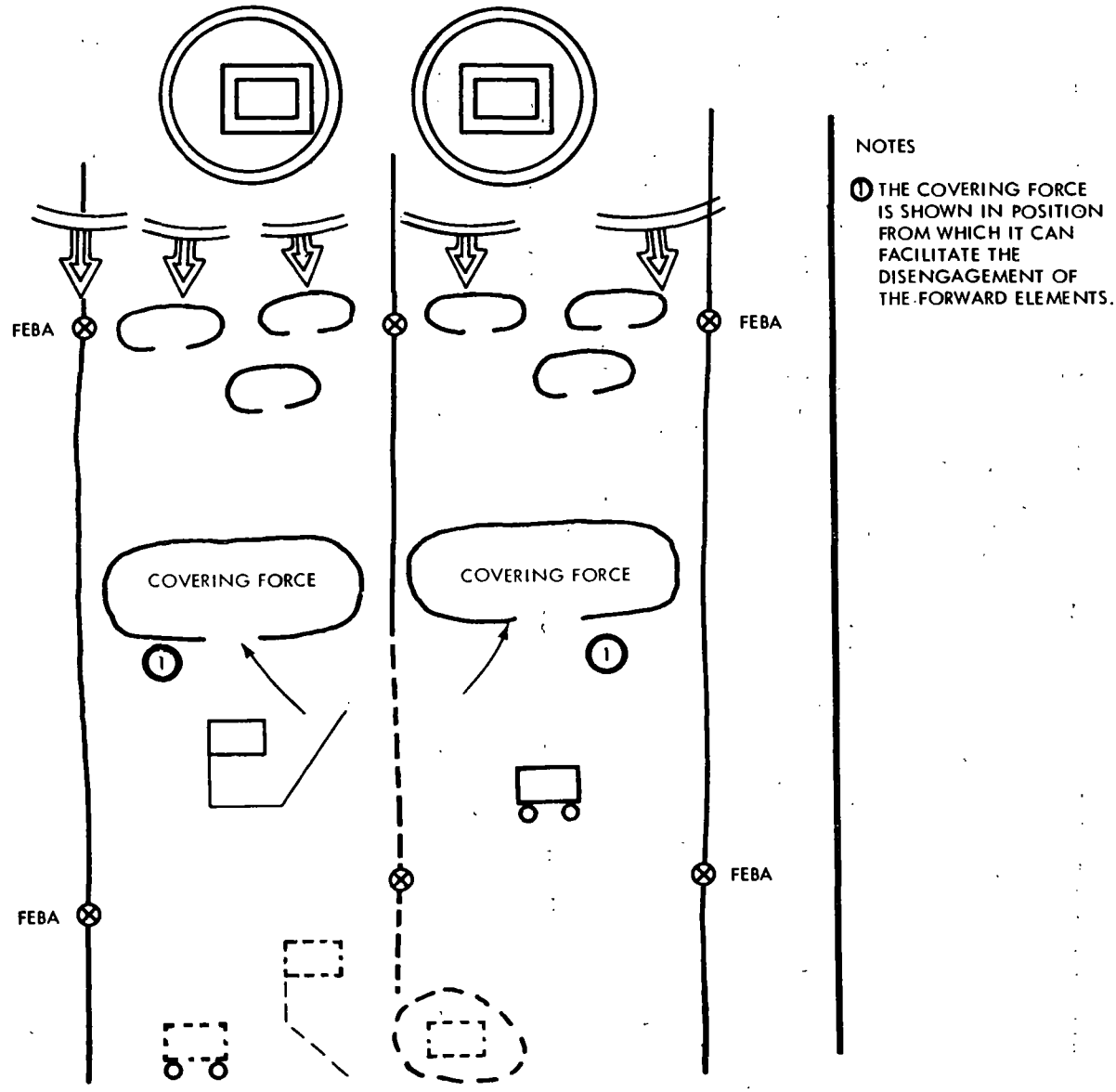
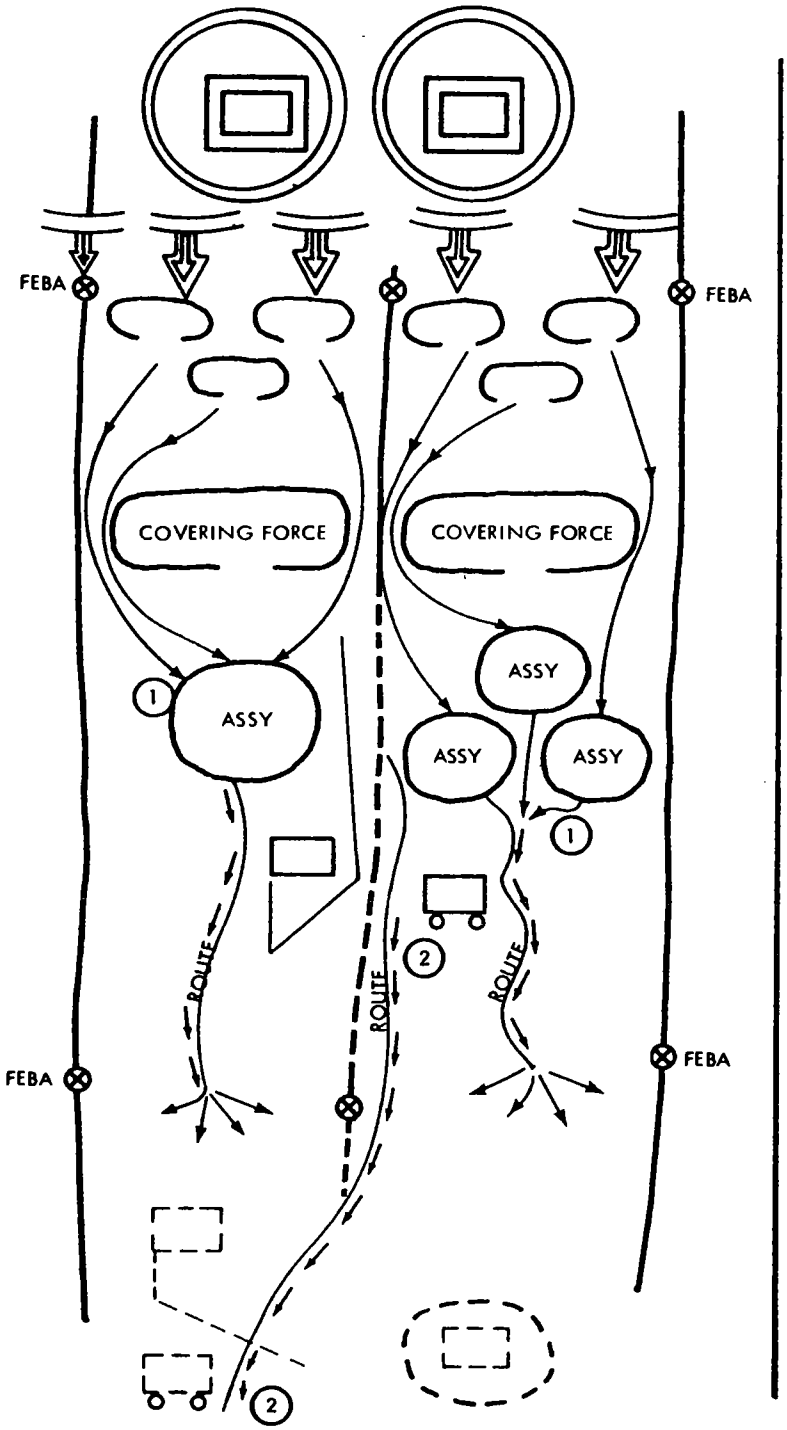


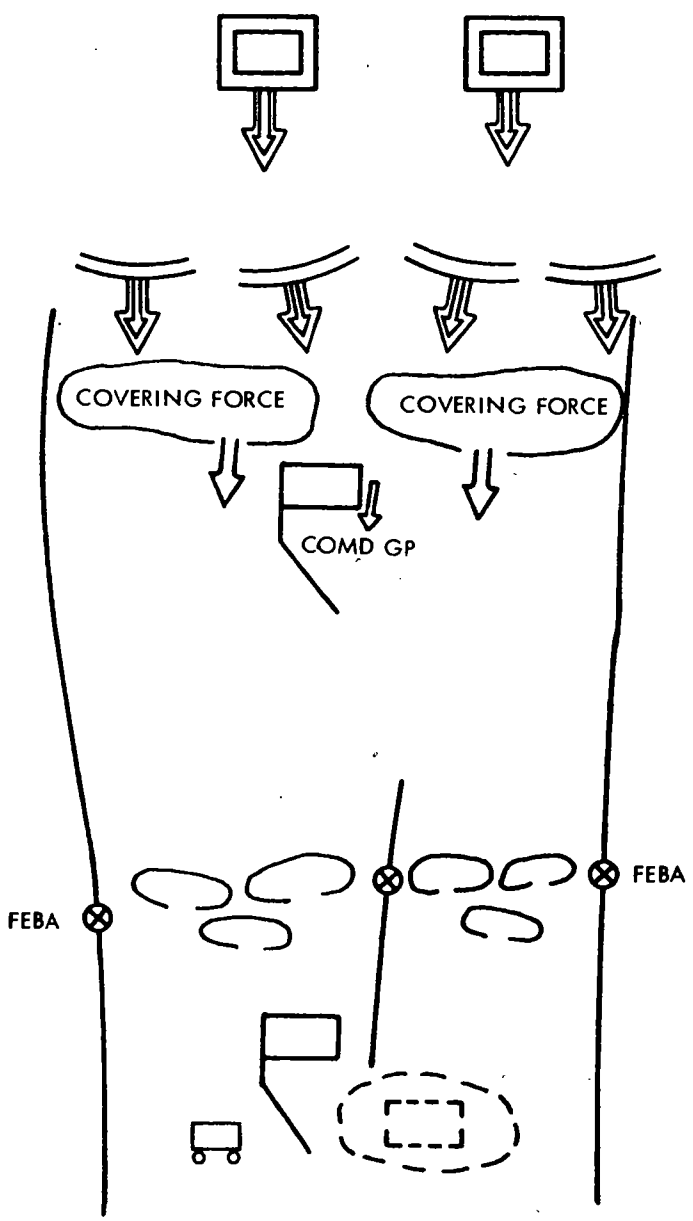
Figure 16–8. Second event in the sequence of an involuntary withdrawal.



NOTES

1. IDEALLY ALL UNITS ON THE FEBA WILL BE WITHDRAWN SIMULTANEOUSLY TO POSITIONS TO THE REAR OF THE COVERING FORCE WHERE THEY MAY ASSEMBLE AND THEN MOVE TO OCCUPY THE NEW POSITION.
2. THE TRAINS ALSO MOVE TO A LOCATION TO THE REAR OF THE NEW POSITION.

Figure 16–9. Third event in the sequence of an involuntary withdrawal.



NOTES

THE COVERING FORCE EXECUTES DELAY IN ZONE AND EXECUTES A WITHDRAWAL THROUGH A REARWARD POSITION (THROUGH THE ELEMENTS NOW OCCUPYING THE NEW POSITION). THIS COVERING FORCE NORMALLY CONSTITUTES THE RESERVE ON THE NEXT POSITION.

Figure 16–10. Last event in the sequence of an involuntary withdrawal.

Section II. DELAY

16–4. General

a. A delaying action is an operation in which a force under pressure trades minimum space for maximum time while inflicting maximum punishment on the enemy without becoming decisively engaged. Although the underlying principle of a delaying action is to gain time without fighting a decisive engagement, a delaying force may be required to conduct close combat. Doctrine for delay operations is the same for day or night.

b. The commander distributes his forces on each delay position into three areas; security, forward defense, and the reserve. These areas correspond to the areas employed in the defense.

c. The delaying force may conduct the operation from a single position or from successive positions. During the conduct of a delay, the delaying force maintains contact with the enemy. The force delays to the maximum between, as well as on, each delay position, taking advantage of obstacles and the long range fires of organic and supporting weapons. Armor and mechanized infantry forces are well suited to effectively conduct delaying actions at night or during other periods of reduced visibility.

d. The following are desirable terrain characteristics of a delay position:

(1) A series of parallel ridges across the line of hostile advance.

(2) Unfordable steams, swamps, lakes, and other obstacles on the front and flanks.

(3) High ground with good observation and long range fields of fire.

(4) Concealment and cover on the postion.

(5) Covered and concealed routes of withdrawal.

(6) A road net and/or areas providing good cross-country trafficability.

16–5. Methods of Delay

a. There are two basic methods of conducting a delaying action at night; delay on successive positions and delay on alternate positions. These methods may be employed separately or in combination with each other.

(1) *Delay on successive positions.* This is a delay employing the command on two or more delay positions in sequence throughout the zone of delay. Forces are employed in the security area, forward defense area, and reserve area on each position (fig. 16–11).

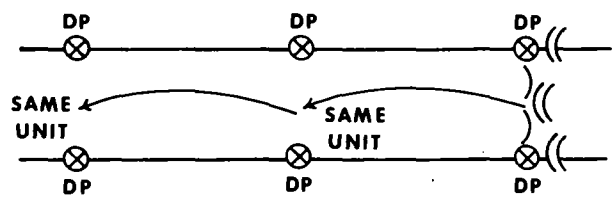


Figure 16–11. Delay on successive positions.

(2) *Delay on alternate positions.* This is a delay employing forces on two delay positions simultaneously. The force on the first position occupies the position and engages the enemy. The force on the second position improves the position, prepares for the passing of forces from the first position through its position, and then engages the enemy. This sequence is repeated on each delay position in depth. Delay on alternate positions may be adopted when the unit zone is narrow enough to permit the force conducting the delay to man two positions simultaneously (fig. 16–12).

(3) *Continuous delay.* Continuous delay is inherent in both delay on successive and alternate positions. Continuous delay involves the maintenance of constant contact with the enemy by at least a portion of the delaying force and includes the use of long range fire and maneuver to cause the enemy to deploy, reconnoiter, maneuver, and take other time consuming measures.

b. The tactical considerations used in selecting the method of delay are—

(1) *Width and depth of zone of action.* To develop a combat power ratio relative to the enemy that permits the delaying force to accomplish its mission, normally, requires a narrow zone of action in order to employ delay on alternate positions. The depth of the zone

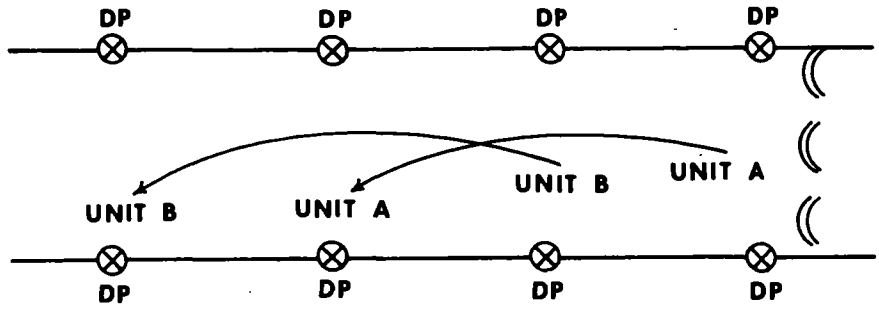


Figure 16–12. Delay on alternate positions.

of action is decided by considering the suitable delay positions available.

(2) *Fires available.* The availability of both nuclear and nonnuclear fires is directly related to the ability of the delaying force to generate combat power.

(3) *Mobility.* When friendly mobility is less than mobility available to the enemy it may be overcome to some extent by employing delay on successive positions.

(4) *Labor availability.* One advantage of delay positions is the ability to prepare rearward delay positions out of contact with the enemy. If a labor force is available, this advantage can be gained in delay on successive positions by preparation of positions in depth.

(5) *Terrain and weather.* The availability of suitable delay positions throughout the zone of action and the cross-country trafficability must be considered to get the maximum use of the forces available to gain time.

(6) *Duration of delay.* The time that the enemy must be delayed has an impact on the selection of the method of delay. The commander must foresee how much time the enemy can be delayed on each available position using the alternate or successive method, and also consider the distances between positions to determine which method is favored.

(7) *Enemy capability.* Enemy capabilities and probable courses of action and how they will affect the various delay positions are also a prime consideration.

16–6. Delay on Successive Positions

a. Delay on successive positions envisions the selection, reconnaissance, improvement, and occupation of each delay position by the delaying force. Terrain or space is never given up unnecessarily. Units delay continuously on or between designated delay positions. The employment of night vision and surveillance devices and battlefield illumination facilitates the delaying forces in their movement to the rear and increases their capability of detecting and firing on enemy forces.

b. Essentially, the delay on successive positions develops as follows:

(1) The commander employs his forces on the initial delay position based on guidance or orders from higher command. The approaching enemy is normally taken under fire at maximum ranges by the security forces. As the enemy advances and comes within range of additional weapons, the volume of fire is increased. Weapons equipped with night vision devices permit the employment of well aimed fires on the approaching enemy.

(2) The purpose of the delay is to inflict the maximum damage on the approaching enemy, while avoiding decisive engagement. When the maximum delay has been achieved and it becomes apparent that further occupation of the position will result in the unit becoming decisively engaged, the withdrawal to the next delay positions begin on order.

(3) When the order to withdraw is received, a portion of the unit displaces directly to the rear and occupies the next designated delay position. The remainder of the unit maintains contact with the enemy and con-

tinues to delay between the previous position and the next rearward delay position. The forces occupying the next delay position direct fires on to the enemy as they come within range and provide support to the force conducting the delay between the previous and next delay position. When forced back by the enemy, the forces that have remained in contact join the delay forces occupying the second delay position. When these consolidated forces are no longer able to hold the new delay position without becoming decisively engaged, the delay precedure is repeated.

(4) During the course of the delay, designated personnel execute demolitions, close lanes through minefields, and prepare other obstacles as time and materiel permit. Toxic chemicals, munitions, and nuclear weapons may be used effectively to create barriers, to reinforce natural obstacles, and to deny the enemy key terrain.

(5) If the delaying force receives enemy nuclear fires, the commander reorganizes and continues his delay mission.

16–7. Delay on Alternate Positions

a. When operating on a narrow front at night the commander with sufficient forces available may elect to delay on alternate positions. The force is divided into two elements. The first element occupies the initial delaying position and engages the enemy. The other element occupies and improves the second delaying position.

b. The units occupying the initial delay position, delay the enemy by employing the continuous delaying techniques. The first delay elements delay on the initial delay position and between it and the second delay position. When the elements arrive at the second delaying position, they withdraw through the units that are prepared and are occupying that position. After withdrawing through the second delay position, the units proceed to the third delay position and begin the preparation and occupation of that position. Responsibility for delay of the enemy is assumed by the units on the second delay position when the first element has withdrawn through the position. The delay procedure is then repeated, with each element being alternately in contact and responsible for accomplishing maximum delay.

c. The delay on alternate positions has the advantage of providing more time for the improvement of delay positions. It also provides troops with periods of relief from combat. However, this technique may render the force vulnerable to enemy nuclear fires because of the frequent massing of troops when conducting the rearward withdrawal through lines.

Section III. RETIREMENT

16–8. General

A retirement is a type of retrograde operation in which a force not in contact moves away from the enemy. The movement normally takes place at night in order to prevent the enemy from observing the retirement. A force in contact with the enemy cannot conduct a retirement. A deployed force would first have to withdraw from contact with the enemy and form march columns before the movement is classified as a retirement. A retirement may be conducted using any means of mobility such as air, sea, or surface transportation.

16–9. Purpose

The purpose of a retirement is to increase the distance between the defender and the enemy, to reduce length of lines of communication, to occupy more favorable terrain, to conform to the disposition of a larger command, or to permit employment of the force in another sector.

16–10. Conduct

The force conducting a retirement plans for the employment of battlefield illumination as a deception or an aid to movement. Night vision and surveillance devices facilitate night movement and provide a means of observation of the enemy's actions during the retirement.

16–11. Security

Appropriate advance, flank, and rear security is provided the main body. When a withdrawal precedes the retirement, a strong rear guard

must be employed. Should the enemy make contact with the rear guard, delay tactics are employed by the rear guard. The advantage of friendly movement during periods of reduced visibility is emphasized. The retiring force may be subjected to guerrilla attacks, airborne raids, air attack, long range fires, and enemy psychological warfare operations. These possibilities are minimized by taking advantage of natural concealment.

PART SIX
OTHER OPERATIONS
CHAPTER 17
NIGHT PATROLS

Section I. NIGHT PATROLLING

17–1. Introduction

The fundamentals of patrolling as discussed in FM 21–75 are unchanged during periods of limited visibility. Operational techniques must be modified to take advantage of the concealment of darkness when planning and conducting patrols. Proper use of available night vision and surveillance devices provides a near daylight capability for the conduct of the night patrol. Night operational techniques discussed elsewhere in this manual are applicable to patrol activities. Available night vision and surveillance devices are discussed in chapter 3.

17–2. General

The patrol is one of the most frequently conducted night operations in combat. Patrol missions are developed and executed to take advantage of all influencing factors, with primary emphasis on avoiding enemy detection. Patrols conducted during periods of reduced visibility are less likely to be detected by the enemy. In cases where the primary mission of the patrol must be performed during daylight, movement to the objective during darkness is desirable, utilizing the passive protection offered by night conditions. Through the use of available night vision devices, surveillance equipment, and illumination means, patrols may be conducted under near daylight conditions regardless of ambient light levels. By combining the favorable influences of daylight and night operations a significant advantage can be gained over the enemy. The techniques discussed in this section are applicable to all types of night patrols. Techniques peculiar to reconnaissance or combat patrols are found in paragraphs 17–10 through 17–15.

17–3. Planning and Preparation for Night Patrols

a. At battalion, the S2 plans missions for reconnaissance patrols and the S3 is responsible for combat patrols. The S2 and S3 plan and insure a coordinated effort. Company size units plan and conduct patrols to facilitate the accomplishment of their missions and to provide security.

b. The Daily Patrol Plan includes all patrols in the battalion area, including those scheduled by subordinate units. This plan, compiled daily by the S2 and S3 and approved by the commander, is sent to higher, lower, adjacent, and supporting elements for information and coordination.

c. Patrol personnel are notified of night patrol missions in sufficient time to permit daylight reconnaissance and other necessary preparations prior to departure. Patrols, when possible, are provided with the latest maps, aerial photos, and sketches showing routes and objective areas. The patrol leader makes a ground reconnaissance and, if possible, an air reconnaissance of the routes and objective areas.

d. Night patrols are equipped with night vision devices, and augmented with scout dogs, special weapons, and ground or air transportation means, based upon the commander's evaluation of METT factors.

e. The individual soldier's preparation for a patrol includes camouflage of his equipment and exposed body surfaces; a serviceability check of his equipment; a test firing of his weapons; and the tying or padding of his equipment to prevent rattling. At night, suf-

ficient time is provided prior to departure for patrol members to adapt their eyes to darkness. Personal effects which would aid the enemy in identifying friendly units are not taken on the patrol.

f. The responsible commanders and/or staff officers supervise rehearsals of actions to occur at the patrol objective, utilizing a mockup or a terrain board of the objective area. Communications are checked during the rehearsals. Prior to departure, the patrol leader and his unit commander or a responsible staff officer, inspect the patrol to insure that the required equipment is being carried and is operational.

g. Patrol movements are coordinated with operations of other units. Control is exercised by assigning general routes, checkpoints, and times to report. Radio is the primary means of communications. Transmission should be held to the minimum possible and good security practices should be maintained. Emergency signals such as pyrotechnics, are prearranged. Deviation from a prescribed route is reported as soon as possible.

h. Fire support plans for each patrol are coordinated to eliminate duplication and insure safety.

i. The patrol leader contacts the responsible staff officer, upon completion of his plans, to coordinate all details and arrange for any additional support desired.

j. The patrol leader's orders to the patrol are clear, concise, and in sufficient detail to insure that each member understands his particular role in the patrol operation.

17-4. Passage of Lines

a. The departure and return of patrols through friendly lines during periods of darkness require detailed planning, coordination, and precise execution.

b. The passage of patrols through a friendly forward unit is conducted in a deliberate and thoroughly coordinated manner. Coordination with the forward unit is accomplished early in the patrol planning. This coordination establishes night recognition signals utilizing metascopes, route(s) into and through the forward position, and passage point(s). When the patrol arrives in the forward unit area, a unit guide leads the patrol to an assembly area of initial rallying point (IRP). The patrol leader completes final coordination with the forward unit commander, to include any changes in recognition signals and friendly and enemy dispositions. Upon completion of final coordination, the patrol is guided to the passage point. Employing starlight scopes, a security party of the patrol observes the area forward of the frontline to the limit of the unit's final protective line (FPL). Simultaneously the compass man prepares a night compass setting at the passage point. After the area is observed and determined clear of the enemy, the patrol leader orders the patrol guided forward to the passage point by the assistant patrol leader (APL). The APL counts each member of the patrol, touching each man on the shoulder to insure an accurate count. The patrol moves quickly and silently through the FPL zone without halting. A security halt is called after the patrol has cleared the FPL zone so patrol members can adapt their night vision, adjust to night noises, and listen for sounds of the enemy. Employing night movement techniques, the patrol then moves to the objective by a predesignated route.

c. Reentry through friendly forward positions is more hazardous than the departure. The patrol leader halts the patrol outside the FPL zone. A reconnaissance team probes the passage point (reentry point). This is the most critical period of the reentry because of the possibility of being mistaken for the enemy. The reconnaissance team moves with caution to avoid being fired on by outposts. Effective use of night viewing devices aids in locating and signalling the friendly forces. Once the reentry point is located and contact with the frontline is established by an exchange of recognition signals employing the metascope, the patrol moves through the reentry point. Each patrol member is identified and counted as they pass the reentry point. A guide from the frontline unit leads the patrol to an assembly area or the IRP. The patrol leader renders a spot report to the commander of the forward elements on the status of the pa-

trol and passes on any information that is of immediate value to the frontline unit.

17-5. Movement at Night

The techniques of movement at night discussed in this manual apply generally to the night patrol. Night vision aids are not employed if there is a possibility that they may jeopardize the security of friendly elements. A patrol moving at night avoids vegetation and soil conditions that might produce unnecessary noise as the patrol moves through the area. However, unavoidable noises may be masked by unusually loud sounds such as wind, vehicles, airplanes, and artillery fire. The employment of night vision devices and the coordinated use of artificial illumination facilitates the patrol's night movement.

17-6. Route Selection

In planning the night patrol, primary and alternate routes are selected based upon a detailed map and aerial photo study, a ground reconnaissance, and an air reconnaissance. All aspects of the terrain are considered. At night, as in day, routes should avoid obstacles and enemy positions. Active and passive night vision devices facilitate detection and passage of obstacles while generally increasing speed and efficiency of movement. When crossing obstacles or ridge lines, care is taken not to become silhouetted against the skyline. Routes are planned to accomplish the mission while taking advantage of existing terrain features for navigation, security, and ease of movement. Movement along the top of ridges or through cross-terrain compartments and populated areas is avoided.

17-7. Navigation

The use of compasses and pacemen are required for accuracy of movement. Active night vision devices are used as signals or beacons to assist in night navigation. Passive night vision devices such as the miniscope and starlight scope provide sufficient observation capabilities to allow the patrol to orient on terrain features. Signalling small arms fire, artillery and mortar illumination, and searchlights may be used to assist in maintaining directional orientation. Usuually the North star or Southern Cross are visible and in some areas both appear. They provide reference points for land navigation purposes.

17-8. Control

Night patrolling also has the problem of control associated with all operations conducted during periods of reduced visibility. Radios are used within the patrol for internal control. The "buddy system" and the policy of "sending up the count" after moving from a halt helps to prevent personnel from becoming separated from the patrol. Friendly surveillance radars may be used for navigation of night patrols. Infrared devices are used for visual control and signalling purposes. The increased vision capability, provided by night vision aids, generally reduces the control problem. Night visibility plans at all levels employ measures that facilitate control of maneuver and fire support elements.

17-9. Security

Certain night security techniques discussed throughout this manual are particularly applicable to the night patrol. The file and column formations provide more flank security than other formations. When it becomes necessary to put out flank security, control is more difficult and speed of movement is reduced. Point and rear security elements are fundamental security measures essential to patrol organization. Maximum use of night vision devices assists the patrol in detecting enemy forces and obstacles. If close combat cannot be avoided, a patrol, utilizing weapons equipped with night vision sights, can direct aimed fire on enemy forces or positions.

Section II. NIGHT RECONNAISSANCE PATROLLING

17-10. General

a. Reconnaissance patrolling is a principal means of providing the commander essential information. The effective use of night viewing devices, battlefield illumination, and night surveillance equipment are fundamental to a night reconnaissance patrol.

b. There are two types of reconnaissance patrols. These can be conducted during darkness when supported by night vision aids and navigational and surveillance equipment. They are—

(1) *Point reconnaissance* conducted to acquire information about a specific location or small area, usually a known position or activity.

(2) *Area reconnaissance* conducted to develop information about an area of interest or certain locations within the area. The patrol secures this information by reconnoitering the area, maintaining surveillance over the area, or by making a series of point reconnaissances.

17–11. Techniques of a Night Reconnaissance Patrol

a. The patrol attempts to reach the objective without being detected. Stealth, patience, and noise and light discipline are emphasized. Reconnaissance patrols traveling short distances can reduce movement noise by wearing soft or canvas shoes. Patrol members are armed and equipped as necessary for accomplishing the mission. At least one member of a reconnaissance patrol is armed with an automatic weapon. A reconnaissance patrol however, fights only when necessary to accomplish its mission or in self defense.

b. A night point reconnaissance patrol is conducted basically the same as a daylight patrol, differing only in techniques of moving and observing. The night point reconnaissance patrol traverses the planned route and takes up a concealed position in the vicinity of the objective, which is designated as the objective rallying point (ORP). The patrol leader conducts an initial reconnaissance of the immediate area using standard binoculars or night viewing devices, as light conditions dictate. Upon completion of his initial reconnaissance, the patrol leader positions the security elements and begins the detailed reconnaissance of the objective, employing the remainder of the patrol. The reconnaissance element moves to several positions to observe the objective, because of the night visibility limitations. It may be necessary to move closer to the objective at night than it would for a daylight reconnaissance. The security elements displace, as required, to secure the reconnaissance element. Upon completion of the reconnaissance, the patrol is assembled, and information concerning the objective is consolidated and disseminated to all patrol member. Several copies of sketches are prepared to insure that the information gets to the parent unit in the event members of the patrol become casualties or are captured. Preliminary reports may be transmitted by radio, with a detailed report submitted upon return.

c. The night area reconnaissance requires the preparation of an NVP for the use of night vision equipment and surveillance techniques. One method of reconnoitering an area during hours of reduced visibility is to provide each man with night vision devices such as infrared binoculars or starlight scopes. Battlefield illumination may be employed to light up the objective area after the patrol is in a concealed position. Procedures for disseminating and reporting reconnaissance information, are the same for an area and a point reconnaissance.

Section III. COMBAT PATROL

17–12. General

Combat patrols perform a variety of tasks deriving their names from specific assigned missions. Although, any of these missions may be accomplished during the day or night, the ability of a force to conduct effective night combat patrolling increases its relative combat power and flexibility. The combat patrols employed to accomplish assigned missions are—

a. Raid Patrols. Raid patrols destroy or capture personnel or equipment, destroy installations, or liberate personnel.

b. Ambush Patrols. Ambush patrols conduct ambushes of enemy patrols, carrying parties, foot columns, and vehicle convoys. The starlight scope is especially suited for use in ambush. It assists the operator in surveying the area surrounding the ambush site prior to establishing the ambush and then provides

good observation of the approaches to the killing zone. Once the enemy has entered the killing zone the operator is able to place accurately aimed and effective fire on the enemy.

c. Security Patrols. Security patrols detect infiltration by the enemy, destroy infiltrators, and protect against surprise and ambush.

d. Contact Patrols. Contact patrols establish and/or maintain contact with friendly or enemy forces.

e. Economy of Force Patrols. Economy of force patrols perform limited objective missions such as seizing and holding critical terrain to allow maximum forces to be used elsewhere.

17–13. Raid Patrols

a. A raid is a surprise attack upon an enemy force or installation with the attacking force (*raid patrol*) withdrawing after accomplishing its mission. During night operations, the smallest raid patrol that can reasonably accomplish the mission is used. The difficulty of achieving surprise and maintaining control increases with the size of the raid patrol. A successful raid is based on accurate, up-to-date, and detailed information of the objective. Inclement weather and periods of limited visibility are used to assist in attaining surprise. The raid is launched from a concealed position established as close to the objective as possible.

b. The use of airborne and airmobile capabilities increases surprise at night. Landing troops in the objective area at night eliminates hazardous cross-country movement, reduces control problems, and increases security. If night airborne or airmobile raids are conducted, the area must be one in which the patrol can easily orient itself on the ground. Airmobile raids supported by aerial artillery or armed helicopters are ideal means for conducting night assaults on enemy installations. By taking advantage of the firepower and mobility of the helicopter, the raid force can move in, strike the objective, and withdraw with minimum support from other sources. For night airmobile operations, see chapter 9.

c. A complete and detailed plan of maneuver, fire support plan, and NVP are prepared to support the night raid. The use of aerial photographs and day and night reconnaissance of the objective area are effective means of obtaining detailed information to assist in developing the plan. If at all possible, the raid commander and key personnel should make a daylight ground or air reconnaissance of the objective. A night aerial reconnaissance is facilitated by the employment of night vision aids and surveillance devices. Techniques for the use of night vision devices discussed throughout this manual are applicable for raids. The plan provides sufficient flexibility for contingencies in the event surprise is lost so that adequate combat power is available to permit reasonable chance of success.

17–14. Ambush Patrol

a. An ambush is a surprise attack from concealed positions upon an unsuspecting enemy force. In stability operations the night ambush patrol is particularly effective since the enemy usually prefers to operate and move under concealment of darkness. Large areas may be controlled by several ambush patrols in random locations. These ambushes discourage night enemy movement, resupply, and offensive activities. Extensive use of night ambush patrols facilitates area control on a round-the-clock basis.

b. Ambush patrols should move into the ambush site after EENT. Camouflage, light, and noise discipline are extremely important in the ambush. Personnel and equipment must blend with the surrounding area, and visible lights are restricted. Once the position is established, movement and noise must be minimized.

c. In addition to the considerations for control and communications discussed in paragraphs 17–1 through 17–9, the timing required for a well executed ambush demands effective control and reliable communications. It is essential that communications be maintained between security elements, observers and the patrol command elements. Wire communications are used whenever possible for internal control. Radio backup is provided, emphasizing communications security measures. Maximum use of visual signals is essential. The command or signal for initiating the am-

bush must be clearly understood by everyone. Minimum movement and maximum noise and light discipline are essential.

d. The fires of all weapons, including artillery, mortars, tactical air, close-in automatic weapons, directional mines, armed helicopters, and other weapons are coordinated in the fire support plan. The time to open fire and cease fire, the assignment of sectors of fire, and the locations of friendly forces are considered. Plans are made for isolating the ambush area to prevent escape and reinforcement of the enemy. A plan for illuminating the ambush site after contact is made is included in the NVP. Illuminating artillery and mortar fires, handheld flares, or illumination grenades can be used for this purpose.

17–15. Other Night Combat Patrols

Security, contact, and economy of force patrols are forms of combat patrols, deriving their names from the specific missions they perform.

a. Security Patrols. Security patrols screen flanks, areas, and routes. In a static situation they prevent the enemy patrols from infiltrating the area and prevent surprise attack. In stability operations security patrols are usually heavily armed and equipped with the capability of becoming a raid patrol. Night operations require alertness and readiness to modify actions at a moments notice. Security patrols are important types of patrols in stability operations areas. Lack of security is a prominent factor contributing to surprise ambushes. The ability of the security patrol to prevent surprise is enchanced by training for night operations and the employment of night vision aids and surveillance devices.

b. Contact Patrols. Contact patrols establish and maintain contact with the enemy or friendly forces. Units use contact patrols to maintain contact with enemy forces operating in their TAOR. Maintaining visual contact is difficult during night patrolling and the use of night viewing devices helps to maintain contact at night.

c. Economy of Force Patrols. Economy of force patrols are equipped and organized in the same manner as a raid patrol. This type patrol at night can be decisive when covering the withdrawal of a friendly force. When employed in this role to seize and hold key terrain, night surveillance equipment can provide early warning, helping the patrol slow enemy movement or deny him access to an area.

Section IV. NIGHT COUNTERAMBUSH TACTICS

17–16. General

In stability operations, the enemy makes extensive use of night ambushes and counterambush measures as a vital part of his night operations. Counterambush operations afford friendly forces opportunities to find the enemy in a position where he can be fixed and destroyed.

17–17. Prevention of Ambushes

a. Precautionary security measures are taken by patrols to prevent an enemy surprise attack. In moving through open or broken terrain at night, all-round security must be maintained. In jungle terrain, security elements must be sufficiently forward to prevent a linear ambush of the main body. The main body must maintain sufficient room to maneuver once the forward security elements make contact. Night vision devices provide the security forces with a means of detecting an ambush force.

b. All available means of communication are used, consistent with security, to assist in maintaining control. Checkpoints and phase lines are control measures used by the commander to facilitate movement control.

c. At night there is a tendency to relax and become careless, especially after returning from an operation. Security elements must be continuously alert to prevent the patrol from being surprised by ambush.

17–18. Reaction to Enemy Ambush

At night three different situations may be encountered upon making contact with an enemy ambush as follows:

a. Enemy Ambush is First Detected by Friendly Elements. In this type of situation the patrol leader makes a decision either to

attack the enemy force or, because of his mission, avoid enemy contact without being detected. Should the patrol withdraw, artillery fire may be placed on the enemy position. When attacking the enemy ambush all members of the patrols are silently deployed to positions where they can best bring their fires to bear upon the enemy ambush. Upon signal from the patrol leader all weapons are fired simultaneously. Fire superiority is gained. Night vision devices allow accurate fire to be placed against elements of the enemy ambush. The enemy ambush force may be assaulted by friendly elements after critical positions have been destroyed by fire. Once the ambush is overcome, the ambush site is searched and cleared.

b. Enemy Ambush is Unsure of Presence of Friendly Force. In this situation one or more members of the enemy ambush force do not believe that a friendly force has made contact with their positions and hence fail to fire their weapons. This is particularly likely to happen when a patrol which has practiced stealth, patience, and noise and light discipline, encounters an enemy force that is not fully alert. Under these circumstances enemy fire will be sporadic in nature. It will lack the volume and accuracy of fire normally placed against a friendly unit after positive contact has been made. In this situation the patrol leader may decide to attack the enemy force or to withdraw.

c. Enemy Ambush Surprises Friendly Force. In this situation all members immediately return fire aiming at enemy muzzle bursts. Fire is characterized by volume, violence, and accuracy. Single enemy positions are destroyed as rapidly as possible to create weak points in the ambush position. Leaders exert dynamic leadership. A base of fire is established and a maneuvering force is designated to assault the enemy from the flank or rear. All members of the patrol must realize that a friendly unit trapped in an enemy ambush will be destroyed if they do not react violently and aggressively in an immediate attempt to destroy the ambushing force.

CHAPTER 18
NIGHT STABILITY OPERATIONS

18–1. General

a. This chapter provides guidance for employment of armed forces in night stability operations. The doctrine for night operations in the preceding portions of this manual is applicable to night stability operations. Only night operations doctrine which is peculiar to or requires emphasis in stability operations is discussed in this chapter.

b. The doctrine and/or employment of infantry, armor, and artillery in conventional operations applies to stability operations with changes in emphasis due to the environment. In addition, psychological operations and civil affairs are particularly important aspects of all stability operations. The general doctrine for stability operations is covered in detail in FM 31–16, FM 31–23, FM 33–1, FM 33–5, FM 41–5, FM 41–10 and FM 100–20.

18–2. Stability Operations

a. Stability operations are conducted to assist a friendly nation prevent or defeat an insurgency. The principal function of military forces in stability operations is to provide a secure environment in which a viable, self-sufficient, and independent country can be developed. Military forces of the host country and their allies may be engaged in nation building activities before an armed insurgent threat exists. However, police forces are normally charged with the security mission until an armed insurgent threat arises. Military combat forces may then be employed to defeat the insurgents. Combat units are assigned, as necessary, missions to protect populated areas, installations, and communications routes; and to locate and destroy insurgent (guerrilla) forces.

b. Night operations are of particular importance during stability operations. Insurgent forces characteristically conduct a large portion of their movements and operations at night. They attempt to use darkness to conceal their activities and to limit the effectiveness of the host country's and allies' superior weapons and mechanized equipment. Consequently, it is essential that extensive and effective night operations be conducted to defeat insurgent forces.

18–3. Tactical Operations

Due to the illusive nature of guerrillas and their ability to strike at any point over wide areas, it is essential that opposing conventional forces cover large areas. This requires continual small unit operations. Characteristically, engagements are initiated by small units which locate or are attacked by guerrillas. The guerrillas attempt to quickly defeat the small unit and withdraw. Consequently, tactical success requires skilled small unit operations, effective and responsive artillery and air support, and rapid reinforcement. These operations are more difficult to perform at night, and tactical units must be well trained to be successful against guerrillas at night.

a. Security Operations. Protection of areas, installations, and communication routes at night is a recurring mission of tactical units in stability operations. The ability of guerrillas to attack at a time and place of their choosing makes a security mission very complex, and it is most difficult at night. The techniques discussed in (1) through (3) below, are employed during night security missions.

(1) *Surveillance.* The entire area being protected and adjacent areas are kept under surveillance. Large areas can be covered from the air—visual, photographic, infrared, and radar aerial surveillance means are used. Although aerial reconnaissance frequently lo-

cates large guerrilla movements and resupply operations, small units moving at night, particularly in rugged terrain or under heavy foliage, are extremely difficult to locate. Signal intelligence (SIGINT) and passive electronic countermeasures (PECM) can also provide large area coverage to determine and follow enemy locations and activities. The principal means of close-in surveillance during the hours of darkness are ground observation posts. OP's use visual and audio means to detect enemy movement. Artificial illumination, active and passive devices, sound amplification devices, and radar are used to aid the surveillance effort. The basic difference between surveillance in conventional operations and stability operations is that in the latter, larger areas are covered by smaller units and a greater requirement exists for 360° surveillance.

(2) *Patrols.* Patrols cover the area to be protected, particularly during the hours of darkness. In addition to locating guerrillas moving at night, the patrols make guerrilla movement more difficult thus helping to keep them out of the area. Patrols concentrate the majority of their efforts on likely routes of movement and around populated areas. Insurgents are usually a part of the local populace or at least are receiving some support from them. They frequently try to come into or leave populated areas during the night. Patrols attempt to stop this movement in and out of populated areas. All patrol activities must be coordinated with local police and security forces to avoid interference and assure complete coverage of the area. Patrols are particularly vulnerable to ambush and must move with caution. Counterambush, fire support, withdrawal, and reinforcement plans must be prepared for each patrol. Patrol movements must be random. If patterns are established the guerrillas will ambush the patrols sooner or later.

(3) *Ambushes.* In addition to the patrols, ambushes are established on likely routes of insurgent force movement. Ambush patrols must be large enough to engage the number of guerrillas that can logically be anticipated, but they should be kept as small as possible to minimize the probability of detection. Coordination with all military and civilian security forces in the area is essential. Also, fire support, reinforcement, and withdrawal plans are prepared. Usually ambushes are established after dark and withdrawn after daylight. However, a pattern must not be established or the insurgents will quickly learn the pattern and evade the ambushes.

b. Offensive Operations. Locating and destroying guerrilla units and bases are normal missions of combat units in stability operations and many actions of this nature are accomplished at night. The offensive operations discussed in (1) through (4) below, are frequently conducted at night during stability operations:

(1) Night attacks against a prepared guerrilla position are conducted in the same manner as in a conventional situation. The guerrilla position should be reconnoitered to the maximum extent possible, and every effort should be made to attack the position from the rear or flank. Guerrillas frequently attempt to draw an attacking force into well prepared crossfire with light forward positions which withdraw when hit. As with daylight attacks against guerrillas, it is usually best to have artillery and airstrikes saturate the area before closing with infantry.

(2) Units frequently move at night in conduct of stability operations. Movement can be mounted, dismounted, or by air. Night movements greatly increase the probability of achieving surprise and are made for the following reasons:

(*a*) *To pursue a guerrilla unit which was engaged during the day and attempts to break contact at night.* In this situation, the guerrillas normally have the advantage of knowing the terrain, and they can greatly impede pursuit by leaving a few mines. Dismounted infantry must provide all-round security in addition to looking for mines when pursuing a guerrilla force so they will rarely be able to keep up with the guerrillas. These disadvantages can be offset by thorough prior reconnaissance of the area, using armored vehicles to lead the pursuit (terrain permitting), and employing a blocking unit in front of the withdrawing guerrillas. Prior reconnaissance

must, as a minimum, include thorough aerial and map study of the area. Armored vehicles using their night vision devices can move quite rapidly over relatively difficult terrain in pursuit of guerrillas who do not have sophisticated antitank weapons. The vehicles will detonate antipersonnel mines with infrequent damage to the vehicles; however, the commander must be prepared to lose some vehicles to gain speed of movement and reduce personnel casualties.

(*b*) *To seal an area preparatory to searching the following day.* A normal tactic of counterguerrilla operations is to surround areas in which guerrillas are believed to be located and then to search the area systematically. Frequently, sealing the area at night provides maximum surprise and, also, insurgents often can be captured in populated areas during the night. Sealing forces converge on all sides of the area simultaneously and make contact as rapidly as possible. In addition, the area selected must be small enough that the allocated forces can effectively seal the entire perimeter. Riflemen equipped with the starlight scope can kill insurgents attempting to break through the seal. Although vehicles may be used to move troops to points near the seal, usually the seal should be established by dismounted troops to avoid alerting insurgents within the encircled area. Once the seal is established, it can profitably be reinforced with armored vehicles.

(*c*) *To reinforce an engaged unit or to block withdrawing guerrillas.* Movement to reinforce or block at night is similar to pursuing a guerrilla force. There is a high probability that mines and ambushes will be encountered. All-round security must be maintained, and counterambush measures must be SOP. Helicopter movement is the fastest and safest method if the situation permits. A deliberate infantry foot movement with an adequate size force is slow, but it has a high probability of reaching the objective. As mentioned above, armored vehicles leading the movement can greatly speed the advance when the terrain and availability of armor permits their use.

(3) Reconnaissance patrols are usually conducted at night as well as during the daytime. Reconnaissance patrols at night during offensive operations are similar to patrols in security operations. However, the patrols usually do not know the area as well, and they do not normally move as far from their parent unit as security patrols. Nevertheless, the same considerations apply. Aggressive night reconnaissance patrolling provides a degree of night security to the parent unit and may locate guerrillas who can be attacked the following day. Information is obtained about the terrain over which the unit may move.

(4) Small raids are conducted at night when adequate intelligence is available. Raids normally are directed toward capturing or killing a group of insurgents or an important individual. Intelligence receives reports of insurgent meetings. Many reports may be false, but well planned and persistent night raids can capture insurgent leaders. Night raids may be either mounted or dismounted, but normal requirements for stealth usually dictate that the final portion of the movement be dismounted. Planning considerations are similar to patrols.

c. Defensive Operations. In stability operations, defense is conducted as an extension of a security mission when guerrillas attack or when units are attacked while engaged in an offensive operation. Guerrillas attack most often at night to minimize the effectiveness of the defender's weapons. They attempt to attack smaller units that they believe they can defeat quickly. Consequently, most night defensive operations require that the defender hold off the guerrillas until reinforcements or artillery fire support are provided, or until daylight when additional fire support means can be brought to bear. As a result, most defensive operations are relatively short and violent. The following night defensive situations are encountered:

(1) *Prepared defense positions are defended.* This occurs when guerrillas attack friendly outposts or installations. Normal defense measures are taken. Success depends on prior warning, well prepared positions, effective grazing fire, well laid obstacles, extensive use of mines, and well planned fire support.

(2) *Hasty defense positions are defended.* This occurs when a unit on a mission is at-

tacked by a superior enemy force. Again, normal defense measures are taken. Every unit must dig in every time it stops moving, and overhead cover must be erected as soon as possible. Interlocking fire must be planned immediately upon arrival in a position, and fire support is simultaneously planned. Extensive rapid emplacement of antipersonnel mines tightens the defense, and early dispatch of patrols reduces the possibility of surprise.

(3) *A night withdrawal may be indicated when a unit is attacked by a superior guerrilla unit.* When a unit on an operation is attacked by a superior enemy unit, and reinforcement is not possible soon enough to prevent unacceptable losses, voluntary withdrawal under cover of darkness should be considered by the commander. Disengagement is conducted as in conventional operations. Fire support and chemical agents are effective in covering the withdrawal. Antipersonnel mines emplaced along the withdrawal route aid in impeding enemy pursuit at night.

(4) *Prior to deciding upon a night withdrawal, the commander must consider that the routes of withdrawal will not be secure and that the probability of ambush will be high.* Reinforcement, in the form of all available firepower, if no troop reinforcement is possible, must be fully exploited by the commander before he decides upon a withdrawal. There should be few instances in stability operations, where the force under attack cannot receive reinforcement in the form of additional forces or firepower.

18–4. Illumination

In conventional operations, each case must be carefully considered as to whether and when to illuminate. In stability operations, artificial illumination is used at some stage in nearly every night operation.

18–5. Psychological Operations

Psychological operations directed at guerrillas can be particularly effective when employed with imagination. Loudspeakers are usually the only immediate means available, but carefully prepared leaflets dropped on guerrillas located at night can be very effective when discovered in their position at daylight. Another effective leaflet technique is to have night patrols leave leaflets throughout the area. This can soon lead the guerrilla to believe his enemies are everywhere. Clear sound from loudspeakers can be heard at greater distances in the quiet of the night. Loudspeakers are effective in keeping guerrillas from sleeping, and nostalgic themes are particularly effective at night. Gunfire simulators coupled with loudspeakers can create fear of being surrounded. Consequently, psychological operations support should be considered for every night operation.

18–6. Civil Affairs

a. Stability operations are characteristically conducted in and around civilians. To protect innocent civilians and to impair insurgent contact with the people, a curfew is usually established. When possible, the curfew should include all the hours of darkness. Curfew is normally proclaimed by the host government, and military units must know the curfew provisions. The Civil Affairs Officer coordinates the curfew with local authorities. Enforcement of the curfew is a portion of the Populace and Resources Control Program, and is normally performed by U.S. Army military police in conjunction with the host country civil and military police (see para 5–18 through 5–25 and applicable portions of the FM 19-series listed in app A).

b. All military night operations in and around populated areas must be coordinated with local authorities. Coordination with police and paramilitary units is particularly important to avoid conflicts and firefights with friendly elements.

18–7. Advisor Operations

During stability operations the United States will normally have advisors with the host country's military forces. Because night operations are essential to successful stability operations, advisors must encourage host country military units to conduct extensive individual and unit night training and night operations. U.S. advisors coordinate host country military operations with U.S. unit operations.

CHAPTER 19
NIGHT RIVER-CROSSING OPERATIONS

Section I. INTRODUCTION

19–1. General
The detailed doctrine and techniques for planning and executing tactical river-crossing operations, and the terms and definitions associated therewith, are contained in FM 31–60. This chapter supplements FM 31–60 by discussing the night vision devices which are used by the crossing force in a river-crossing operation conducted under the cover of darkness.

19–2. Purpose of a Night River-Crossing
The purpose of a river crossing is to move the attacking force across a river obstacle as rapidly and efficiently as possible, so that it may either continue its attack to destroy the enemy or seize objectives that will protect the crossing of the force. *The purpose of a night river-crossing is to obtain surprise and to conceal operations at the river line under cover of darkness.*

19–3. Time of Crossing
As river-crossing sites normally represent defile target zones, a crossing operation is best conducted and concealed from observation when it is carried out under cover of darkness or under conditions of reduced visibility such as smoke, fog, or rain. However, many factors influence whether a crossing is made in daylight or darkness. Such factors as the need for concealment, the state of training of the friendly forces, the nature of the terrain, the characteristics of the water obstacle, the enemy disposition and capabilities (such as use of nuclear, chemical, and biological weapons; minefields on the far bank; and the ability of the enemy to make air and tank attacks), and the need for speed are all considered. Based on these factors, and other available intelligence, a decision is made to plan and execute the river crossing under the following time and light conditions.

a. Daylight Crossing. A daylight crossing is normally made when greater speed of crossing is desired, the friendly forces have air superiority, and it is imperative to seize objectives on the far shore. Heavily wooded or rough terrain generally favors a daylight attack and smoke is used for both concealment and deception.

b. Night Crossing.

(1) A night crossing is normally made when the element of surprise is desired. It is also desirable when friendly air superiority does not exist. Open terrain generally favors a night attack.

(2) A night crossing usually begins under blackout conditions. The assault force of the crossing force with the crossing means provided and equipped with night vision devices, attempts to cross the water obstacle by stealth, to land on the far bank, and to advance as rapidly as possible toward their objective. Subdued artificial lights may be used to expedite crossing operations when the assault forces have eliminated enemy small arms fire at the crossing site. Eventual expansion of the bridgehead by the assault forces to the point where the crossing site is no longer vulnerable to enemy artillery fire, permits full use of high intensity artificial illumination. Thus construction of rafts and bridges is hastened and entry and exit points on the near and far shore can be lighted for safety to increase the speed of vehicles and personnel making the crossing.

19–4. Crossing Means
All available means are used to cross the maximum number of troops and the greatest

amount of equipment in the shortest possible time. This is particularly important at night, as daylight may allow the enemy to observe and to cut off the bridgehead from the near shore. The means available to the assault forces are—the M113, Armored Personnel Carrier; the M114, Armored Command and Reconnaissance Carrier; the M551 Armored Reconnaissance Airborne Assault Vehicle; the M109 155-mm self-propelled howitzer; and certain wheeled vehicles, such as the LARC V, all of which have a swimming capability; aircraft, both fixed and rotary wing; assault boats, rafts, ferries and bridges provided by the divisional engineer battalion; and the main battle tank which has both a shallow and deep fording capability. Additionally, vehicles of the landing vehicle, tank, family (LVTP), organic to engineer amphibious units, are used when these units and vehicles are available.

19–5. Night Vision Devices

For the planning of either a hasty or deliberate crossing under blackout conditions, the amount of natural light, the availability of night vision devices, and the use of artificial illumination must be considered and this information contained in the night visibility plan (NVP).

Section II. EMPLOYMENT OF NIGHT VISION DEVICES

19–6. Crossing Echelons

a. For functional convenience and planning purposes, the river crossing force is divided into five basic echelons—

(1) The assault echelon.
(2) The fire support echelon.
(3) The engineer echelon.
(4) The following echelon.
(5) The rear echelon.

b. These echelons employ all available active and passive night vision devices during a blackout crossing.

19–7. Assault Echelon

The assault echelon may be composed of infantry units, mechanized infantry units, armored units, or a combination. In addition to the tactical forces normal to offensive operations, the assault echelon may be composed of amphibious vehicle units, engineer boat teams and guides, and army aviation units.

a. The Tactical Unit. The forces normal to offensive units are equipped with both active and passive night vision devices. Dismounted infantry makes the crossing in 15-man assault boats manned by engineer personnel. Mechanized infantry makes the crossing in M113's and M114's. Where the depth of the river permits, armor units, or tanks participating as part of a combined arms team, and equipped with deepwater fording kits, advance with speed and violence to ford the river and continue the momentum of the attack. When possible bridges are seized intact. For a discussion of the employment of the night vision equipment organic to the personnel and equipment of these units, see Part Three. To preserve a far shore capability to operate at night, extreme care must be exercised to prevent the loss of night vision devices in the over-the-water assault. Members of boat teams using handheld night vision devices, may secure them with a strap or tent rope.

b. Amphibious Vehicle Units. Amphibious vehicle units are equipped with vehicles with a swimming capability. These vehicles, when equipped with infrared filtered headlights and operated by drivers equipped with electronic binoculars, are used to transport personnel, cargo, and weapons in support of the assault echelon. The landing vehicles (LVT-series) and the amphibious lighters (LARC-series) are also used for transporting personnel and cargo when equipped with night vision devices.

c. Engineer Boat Teams and Guides. Engineer boat teams and guides employ 15-man assault boats to transport dismounted infantry across the water obstacle when the M113 is not available. The 15-man assault boat may be propelled by paddles or outboard engine. After the first wave has crossed, a guide equipped with a metascope or other infrared signal device and the electronic binocular is left on the far shore and signals to a similarly equipped member of the engineer boat crews to guide

succeeding waves of the assault element to their intended landing areas.

d. Army Aviation Units. Army aircraft are used to airdrop critically needed supplies into the bridgehead or to airland personnel or supplies across the river. During night crossings, maximum use is made of night operating aids to guide aircraft to landing zones.

19–8. Fire Support Echelon

Fire support is furnished by tactical air, armed helicopters, aerial artillery, and the normal ground fire support means. As the principles for the control of fire support during a river crossing do not differ from other offensive operations, the discussion on fire support contained in paragraphs 4–9 through 4–16 is applicable.

19–9. Engineer Echelon

The unit engineer is responsible for the technical plans to provide engineer crossing means for the supported unit. The large scale use of assault boats and footbridges is not required when sufficient quantities of Army aircraft and amphibious vehicles are available. Construction of rafts and bridges at selected sites is begun as soon as prohibitive enemy fire is removed from the crossing site. See paragraphs 4–17 through 4–24 for a discussion of bridge and raft construction and mine clearance, using night vision devices.

19–10. Followup Echelon

The followup echelon consists of reserve combat units, far bank engineers, additional field artillery units, forward air defense weapons, signal, and combat service support elements such as military police and medical units, as required for the immediate support of the assaulting units. The units constituting the followup echelon employ the night vision devices and techniques discussed in the applicable chapters of this manual.

19–11. Rear Echelon

The rear echelon is composed of combat service support elements and others whose missions are not directly affected by the river-crossing operation. The units constituting the rear echelon employ the night vision devices and techniques discussed in the applicable chapters of this manual.

APPENDIX A
REFERENCES

A–1. Army Regulations (AR)

190–60	Physical Security Standards for Nuclear Weapons.
320–5	Dictionary of United States Army Terms.
320–50	Military Terms, Abbreviations, and Symbols.

A–2. Department of the Army Pamphlets (DA Pam)

108–1	Index of Army Films, Transparencies, GTA Charts, and Recordings.
310–1	Index of Administrative Publications.
310–3	Index of Doctrinal, Training, and Organizational Publications.
310–4	Index of Technical Manuals, Technical Bulletins, Supply Manuals, Supply Bulletins, Lubrication Orders, and Modification Work Orders.

A–3. Field Manuals (FM)

1–20 (TEST)	Nondivisional Combat Aviation Battalion, Group and Brigade.
1–100	Army Aviation Utilization.
1–110	Armed Helicopter Employment.
5–1	Engineer Troop Organizations and Operations.
5–135	Engineer Battalion, Armored, Infantry and Infantry (Mechanized) Divisions.
5–136	Engineer Battalion, Airborne and Airmobile Division.
5–144	Engineer Amphibious Units.
6–20–1	Field Artillery Tactics.
6–20–2	Field Artillery Techniques.
6–121	Field Artillery Target Acquisition.
6–122	Artillery Sound Ranging and Flash Ranging.
6–140	Field Artillery, Cannon Battalions and Batteries.
6–161	Radar Set AN/MPQ–4A.
7–11	Rifle Company, Infantry, Airborne, and Mechanized.
7–15	RIfle Platoon and Squads, Infantry, Airborne, and Mechanized.
7–20	Infantry, Airborne Infantry, and Mechanized Infantry Battalions.
7–30	Infantry, Airborne, and Mechanized Division Brigades.
17–1	Armor Operations.
17–15	Tank Units, Platoon, Company, and Battalion.
17–36	Divisional Armored and Air Cavalry Units.
19–1	Military Police Support, Army Divisions, and Separate Brigades.
19–2	Military Police Support in the Field Army.
19–25	Military Police Traffic Control.
19–30	Physical Security.
19–40	Enemy Prisoners of War and Civilian Internees.
19–45–1 (TEST)	Rear Area Protection.

20–20	Military Dog Training and Employment.
20–22	Vehicle Recovery Operations.
20–33	Combat Flame Operations.
20–60	Battlefield Illumination.
21–5	Military Training Management.
21–6	Techniques of Military Instruction.
21–30	Military Symbols.
21–75	Combat Training of the Individual Soldier and Patrolling.
24–1	Tactical Communications Doctrine.
30–5	Combat Intelligence.
30–20	Aerial Surveillance/Reconnaissance, Field Army.
(CM) 30–31	Stability Operations—Intelligence (U).
(S) 30–31A	Stability Operations—Intelligence Collections (U).
31–16	Counterguerrilla Operations.
31–22	U.S. Army Counterinsurgency Forces.
31–23	Stability Operations—U.S. Army Doctrine.
(C) 31–40	Tactical Cover and Deception (U).
31–60	River-Crossing Operations.
(C) 32–5	Signal Security (SIGSEC) (U).
(S) 32–10	U.S. Army Security Agency Support to a Field Army (U).
(C) 32–20	Electronic Warfare (Ground based) (U).
33–1	Psychological Operations—U.S. Army Doctrine.
33–5	Psychological Operations—Techniques and Procedures.
41–5	Joint Manual for Civil Affairs.
41–10	Civil Affairs Operations.
54–2	Division Support Command.
55–4–1 (TEST)	Transportation Movement in a Theater of Operations.
55–15	Transportation Reference Data.
55–21–1 (TEST)	Transportation Railway Units and Operations.
55–35–1 (TEST)	Motor Transport Operations and Motor Transport Units.
55–50–1 (TEST)	Transportation Amphibian Operations.
55–55–1 (TEST)	Transportation Terminal Operations.
55–58	Transportation Boat Operations.
57–1	U.S. Army/U.S. Air Force Doctrine for Airborne Operations.
57–35	Airmobile Operations.
57–38	Pathfinder Operations.
61–100	The Division.
100–10	Field Service Regulations, Administration.
(C) 100–20	Field Service Regulations, Internal Defense and Development (IDAD) (U).
101–5	Staff Officer's Field Manual: Staff Organization and Procedure.
101–31–1	Staff Officer's Field Manual: Nuclear, Weapons Employment, Doctrine and Procedures.
(S) 101–31–2	Staff Officer's Field Manual: Nuclear Weapons Employment, Effects Data (U).

A–4. Technical Manuals (TM)

5–1090–200–15	Operator, Organizational, Ds, Gs, and Depot Maintenance Manual: Weaponsight Infrared Telescope Assembly.

5–1090–203–15	Operator, Organizational, Field and Depot Maintenance Manual, Including Repair Parts and Special Tool Lists: Metascope Assembly, Image Infrared, Transistorized.
(O) 11–1090–268–13	Organizational and DS Maintenance Manual: Night Vision Sight, Individual Served Weapon AN/PVS–1.
11–1303	Installation and Operation: Radar Sets AN/MPQ–10 and AN/MPQ–10A.
11–1303–ESC	Equipment Serviceability Criteria: Radar Set AN/MPQ–10A.
11–1503	Radar Set, AN/MPQ–10A, Repair Manual.
11–5840–208–10	Operators Manual: Radar Set AN/MPQ–4A.
11–5840–208–20	Organizational Maintenance Manual: Radar Set AN/MPQ–4A.
11–5840–211–12	Organizational Maintenance Manual: Radar Set AN/PPS–4 and AN/PPS–4A.
11–5840–217–10	Operators Manual: Radar Sets AN/TPS–25, AN/TPS–25A, and AN/TPS–25(XE–2).
11–5840–217–20	Organizational Maintenance Manual: Radar Sets AN/TPS–25, AN/TPS–25A, and AN/TPS–25(XE–2).
11–5840–229–15	Operators' Organizational, Field and Depot Maintenance Manual: Radar Sets AN/TPS–21, AN/TPS–33, and AN/TPS–33A.
11–5850–228–13	Organizational and DS Maintenance Manual: Including Repair Parts and Special Tool Lists: Night Vision Sights, Tripod Mounted.
11–5855–202–13	Organizational and DS Maintenance Manual: Night Vision Sight: Crew Served Weapons Models 9927 and 9927A.
11–5855–203–13	Organizational and DS Maintenance Manual: Night Vision Sight Individual Weapons Mounted AN/PVS–2.
11–5895–213–10	Operators Manual: Sound Ranging Set GR–8.
(C) 11–5895–284–12	Operator and Organizational Maintenance Manual: Radar Surveillance Set AN/APS–94A, AN/APS–94B, AN/APS–94C (U).
11–6350–200–10	Operators Manual: Alarm Set, Anti-Instrusion, AN/GSS–9.
11–6650–275–15	Organizational, DS, GS, and Depot Maintenance Manual: Binocular, Infrared, Driving Metallic Body.
11–6720–208–12	Organizational Maintenance Manual: Cameras, Still Picture KA–30 and KA–30A2.
21–305	Manual for the Wheeled Vehicle Driver.
55–310	Truckmaster's Handbook.
55–501	Marine Crewman's Handbook.

A-5. Training Circulars (TC)

23–11	Starlight Scope, Small Handheld or Individual Weapons Mounted.

A–6. Other References

JCS Pub 1	Dictionary of U.S. Military Terms for Joint Usage (JD).
JCS Pub 2	Unified Action Armed Forces (UNAAF).

APPENDIX B

GROUND SIGNALS, ILLUMINATING GRENADES, SHELLS, AND AIRCRAFT FLARES.

Table I. Characteristics of Ground Signal, Illuminating Grenade, and Trip Flares

	Signal, illumination, ground, white star, parachute, M127 (hand held).	Grenade, hand, illuminating, Mark 1	Flare, surface, trip, parachute, M48	Flare, surface, trip, M49
Candlepower	50,000	55,000	110,000	40,000
Approximate burning time (second).	27	27	20	55
Approximate rate of descent (feet per second).	10–15	Does not apply.	3	Does not apply.
Approximate diameter of area illuminated (meters).	450	200	275	300
Approximate HOB (meters)*.	165	Does not apply.	90**	Does not apply.
Approximate maximum range (meters).	250	Hand thrown 40 meters.	None. Fired vertically only.	Hand thrown 30 meters.
Fuze time	5.5-second delay.	7-second delay.	3-second delay.	Instantaneous.
Type of projectors	Handheld rocket type launching mechanism incorporated in signal.	Hand thrown.	None.	Hand thrown or fixed to stake or tree.

* Based on burnout of flare 30 meters above ground.
** Flare activates 75 to 120 meters above ground: this altitude cannot be controlled.

Table II. Characteristics of Artillery and Mortar Illuminating Shells

	Approximate candlepower	Approximate burning time (seconds)	Approximate rate of descent (feet per second)	Approximate diameter of area illuminated (meters)	Approximate HOB (meters)	Approximate maximum range (meters) (air burst)	Continuous illumination (rounds per minute)
*Mortars**							
81-mm, M301A2	500,000	75	12	1,110	400	2,100	2
4.2-Inch M30	500,000	70	30	800	700	4,800	2
*Artillery***							
105-mm Howitzer M314 series	600,000	60	35	1,000	750	8,500	2
155-mm Howitzer M118 series	500,000	60	35	1,000	750	11,600	2
155-mm Howitzer M485 series	1,000,000	120	15	2,000	950	14,000	1

* Reference TM 9-1300-205.
** Reference TM 9-1300-203.

Table III. Illuminating Characteristics of Aircraft Flares

	Flare, aircraft, parachute, Mark 6	Flare, aircraft, parachute, Mark 24	Flare, aircraft, parachute, M26A1
Approximate weight (pounds)	53	23	30
Classification	Limited standard	Standard (Army)	Limited standard
Candlepower	800,000	2,500,000	1,000,000
Approximate burning time (minutes)	3	2	3
Approximate rate of descent (feet per second)	12	10	8.3
Approximate diameter of area illuminated (meters)	1,800	3,500	2,300
Best advantage height for flare activation (feet above terrain).	3,250	2,500	3,000
Minimum drop altitude (feet)	2,700	1,600	1,800
Fuze time	5 to 92 seconds	5 to 30 seconds	Variable delay 300 to 12,000 feet
Ammunition requirement for continuous illumination (flares per point per hour).	24	40	24

APPENDIX C

BINOCULAR, ELECTRONIC, AN/PAS-3

C-1. Description and Use

This helmet (or helmet liner) mounted infrared binocular (fig. C-1) is primarily intended to permit night driving at normal speeds when used in conjunction with the infrared filtered vehicle headlamps. It also has a limited use as an infrared observation device. It may be used with any infrared light source for night tasks requiring visual security, binocular vision, and freedom of movement. In addition to driving, typical tasks include equipment operation, construction, and

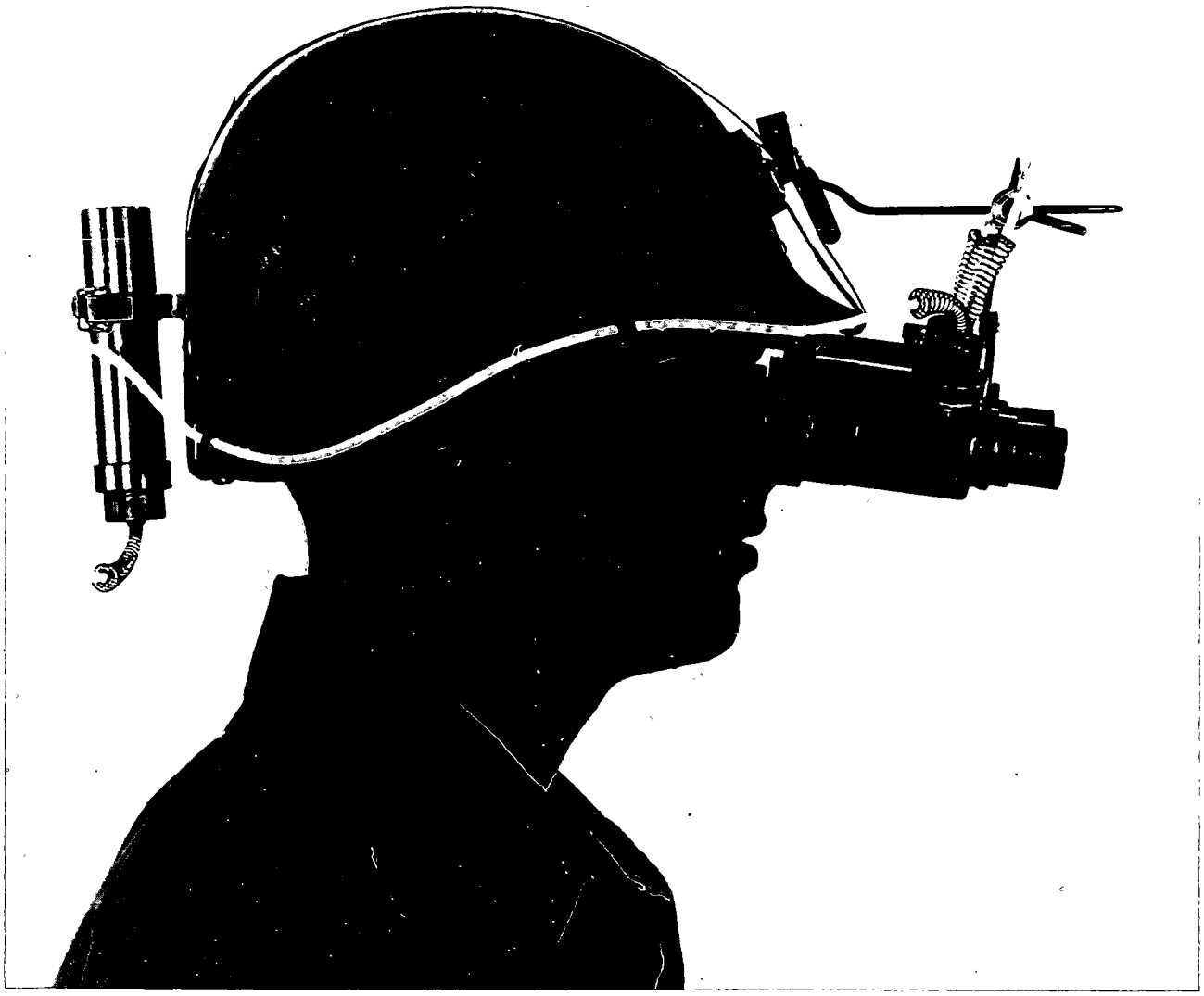


Figure C-1. Binocular, electronic, AN/PAS-3.

patrolling. The binocular consists of two image converter tubes mounted binocularly and a power source. The power source mounts at the rear of the helmet to counterbalance the binocular. Although the binocular can be used for close tasks, its limited depth of field at near ranges requires frequent refocusing for tasks of this nature. This item of equipment will be replaced by the electronic binocular T–7 (fig. C–2).

C–2. Characteristics

a. Viewing Range—50 meters with infrared filtered vehicle headlamps.

b. Focusing Range—12″ to infinity.

c. Magnification—Unity.

d. Field of View—27°.

e. Weight—2.0 lbs (includes power supply).

f. Battery—1.2 V disposable mercury battery.

g. Battery Life—40 hours continuous operation.

h. Federal Stock Number 5855–789–0639.

C–3. References

a. TM 11–6650–275–15.

b. TM 11–6650–275–25P.

Figure C–2. Prototype of binocular, electronic, T–7, which will replace binocular, electronic, AN/PAS–3.

APPENDIX D
IMAGE METASCOPE, INFRARED

D–1. Description and Use

This image forming metascope (fig. D–1) is a lightweight, handheld, near infrared viewing device equipped with a small accessory infrared light source. The metascope, which uses a single stage image converter tube, is powered by a small mercury battery. This multipurpose viewer is capable of detecting enemy infrared light sources at ranges of several miles. It may be used as an aid for night assembly of personnel by homing on a infrared beacon. When used with its component infrared light source, it permits reading of maps, reading of small road signs, as well as close range surveillance. When used with high intensity infrared light sources, such as the Xenon searchlight, its useful viewing range is greatly extended. The metascope, with its own or other infrared light sources, also has a limited night infrared signaling capability.

D–2. Characteristics

a. Viewing Range—50 meters (with own light source).

b. Detecting Range—Up to 10 miles (dependent upon intensity of light source being viewed).

c. Field of View—25°.

d. Magnification—1.1X.

e. Weight—2.75 pounds including own light source.

f. Battery Life—
(1) Metascope—60 hours.
(2) IR Flashlight—2 hours.

g. Federal Stock Number 1090–790–6197.

D–3. Reference

TM 5–1090–203–15.

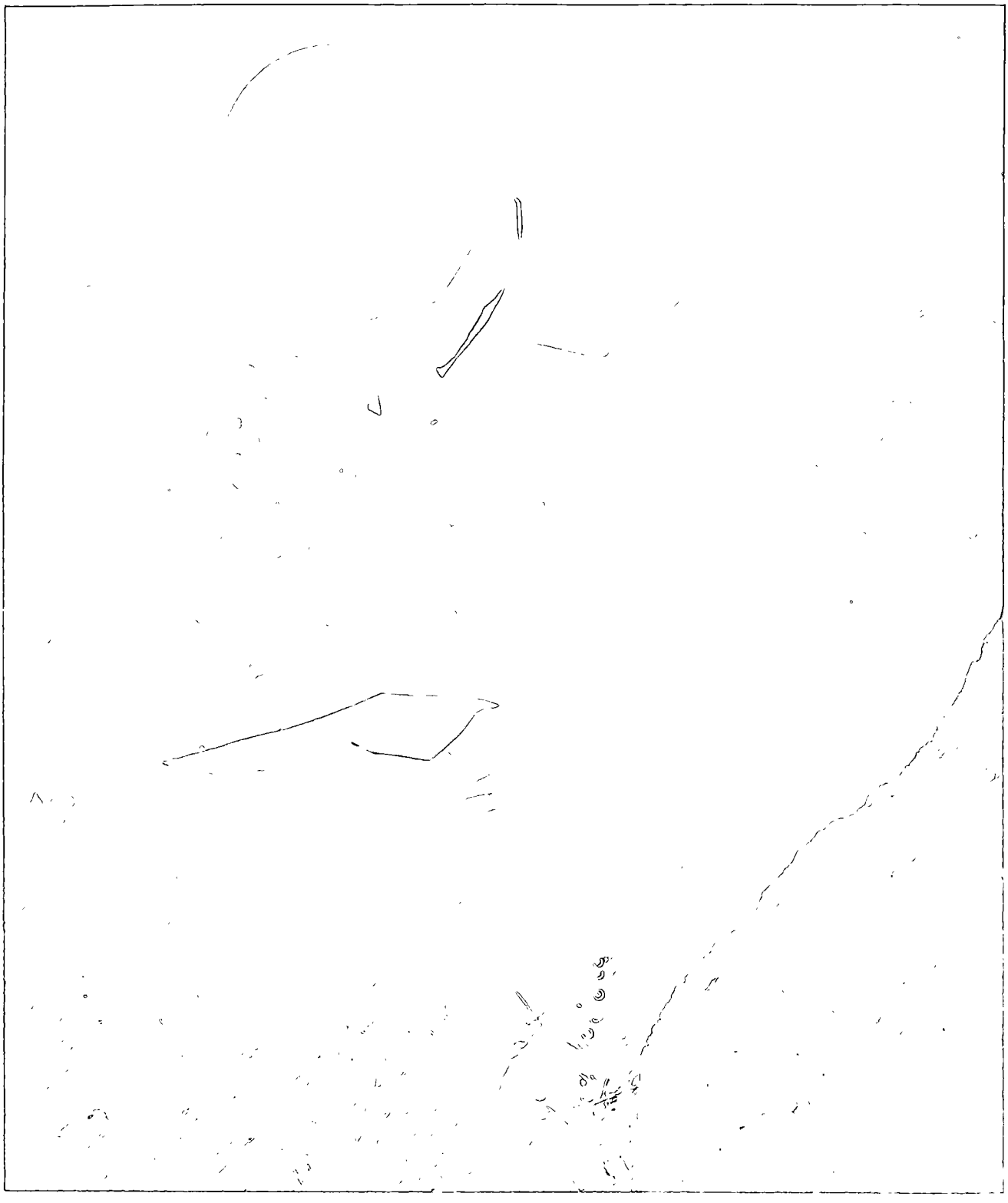


Figure D–1. Image metascope, infrared.

APPENDIX E
INFRARED SEARCHLIGHT, AN/VSS-1, AN/GSS-14, AN/ASS-1, OR AN/MSS-3

E-1. Description and Use

a. The infrared searchlight (commonly known as the Xenon searchlight) was primarily designed for tanks and for tank night operations (fig. E-1). However, a special mounting kit was developed and the searchlight may now be mounted on ¼-ton trucks, patrol boats, aircraft, and guard towers. The searchlight has the following modes of operation:

(1) Visible Compact Beam.
(2) Visible Spread Beam.
(3) Infrared Compact Beam.
(4) Infrared Spread Beam.
(5) Blackout.

b. In the visible or infrared compact beam mode, the beam has a spread of 0.5°. In the spread mode, the beam is optically spread in the horizontal direction to 6°.

c. The average peak beam candlepower of the searchlight is in excess of 120 million; the peak candlepower reaching 150 million, with the capability of overdriving the lamp for short periods of time by increasing the normal current by 50 percent. This increases the intrinsic brightness of the lamp and the candlepower of the searchlight, thus extending the viewing range during these short periods. The searchlight is dust and waterproof. The lamp is cooled by forced air blown over the lamp and through an air-to-air heat exchanger.

d. For tank operation, the searchlight is paraxially mounted with the tank gun and is controlled from inside the tank. It can be instantly switched to either infrared or visible light, to a narrow high intensity beam, or to a wider diffused beam in either light mode. Companion night vision devices are contained in the tank night vision kit. They include the M-18 binocular, a handheld infrared binocular (app F) used by the tank commander for open hatch observation, the M-32 and M-36 periscopes used by the tank gunner and tank commander for closed hatch operations and the infrared driver's periscope (app AE) used by tracked vehicle drivers (figs. E-2 and E-3).

e. The infrared searchlight is also mounted on the ¼-ton truck, boats, aircraft, and guard towers to provide high intensity infrared light for patolling, surveillance, and other night operations (fig. E-4). Current production models have a slightly different design and mounting configuration than shown in fig. E-4.

E-2. Characteristics

a. Beam.
(1) Narrow—0.5 degrees.
(2) Spread—6 degrees.

b. Dimensions.
(1) Height—20½ inches
(2) Width—30¾ inches
(3) Length—31½ inches

c. Federal Stock Number.
(1) Tank Mounted (AN/VSS-1) 6230-901-8639
(2) Truck Mounted (AN/GSS-14) 6230-933-4468
(3) Helicopter Mounted (AN/ASS-1) 6230-993-4467
(4) Truck Mounted (M151A1) (AN/MSS-3) 5855-933-7737

E-3. References

TM 11-6230-219-12.

Figure E–1. Searchlight, infrared, AN/VSS–1, mounted on M48 Tank.

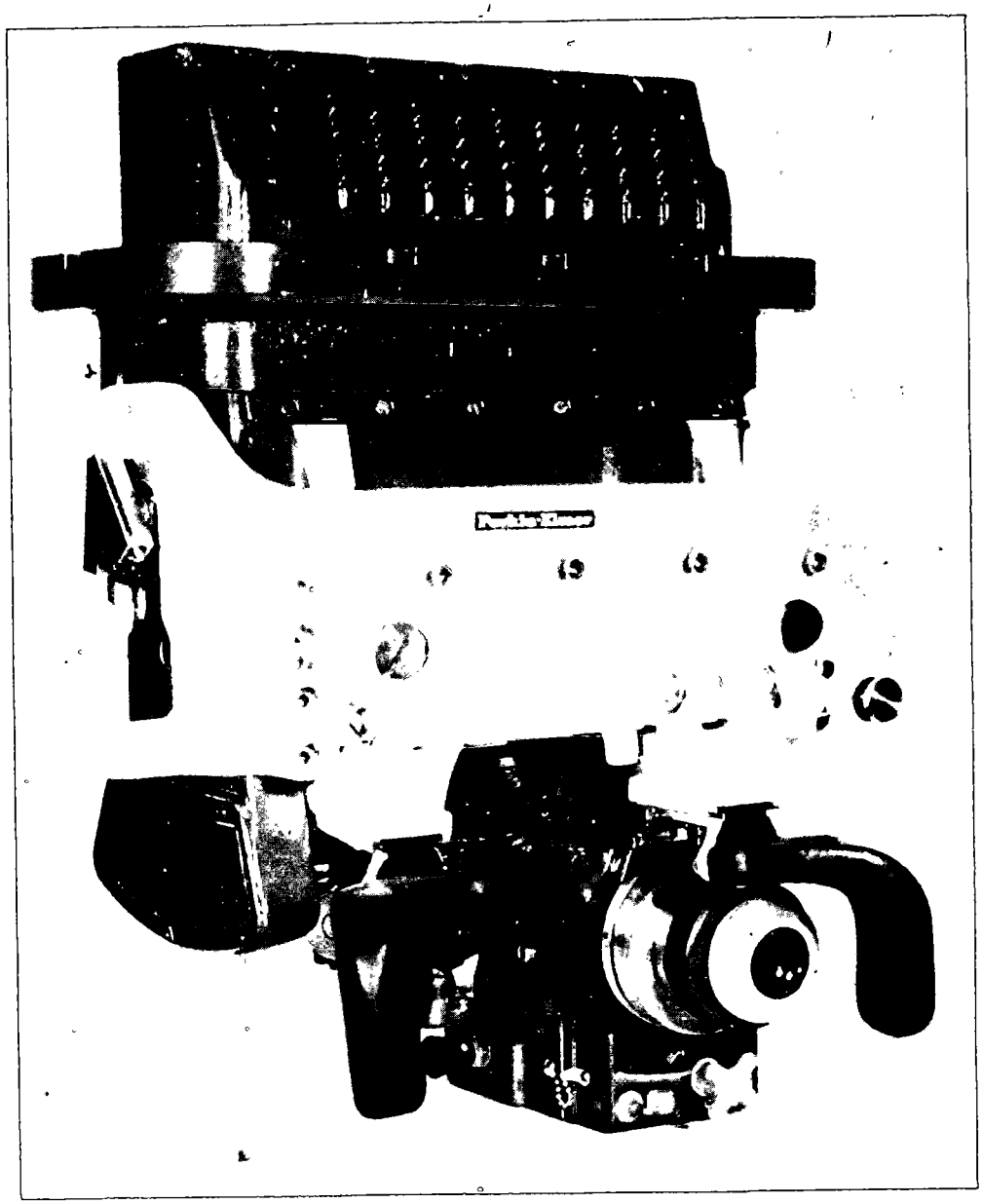


Figure E–2. Periscope, tank gunner's, M–32.

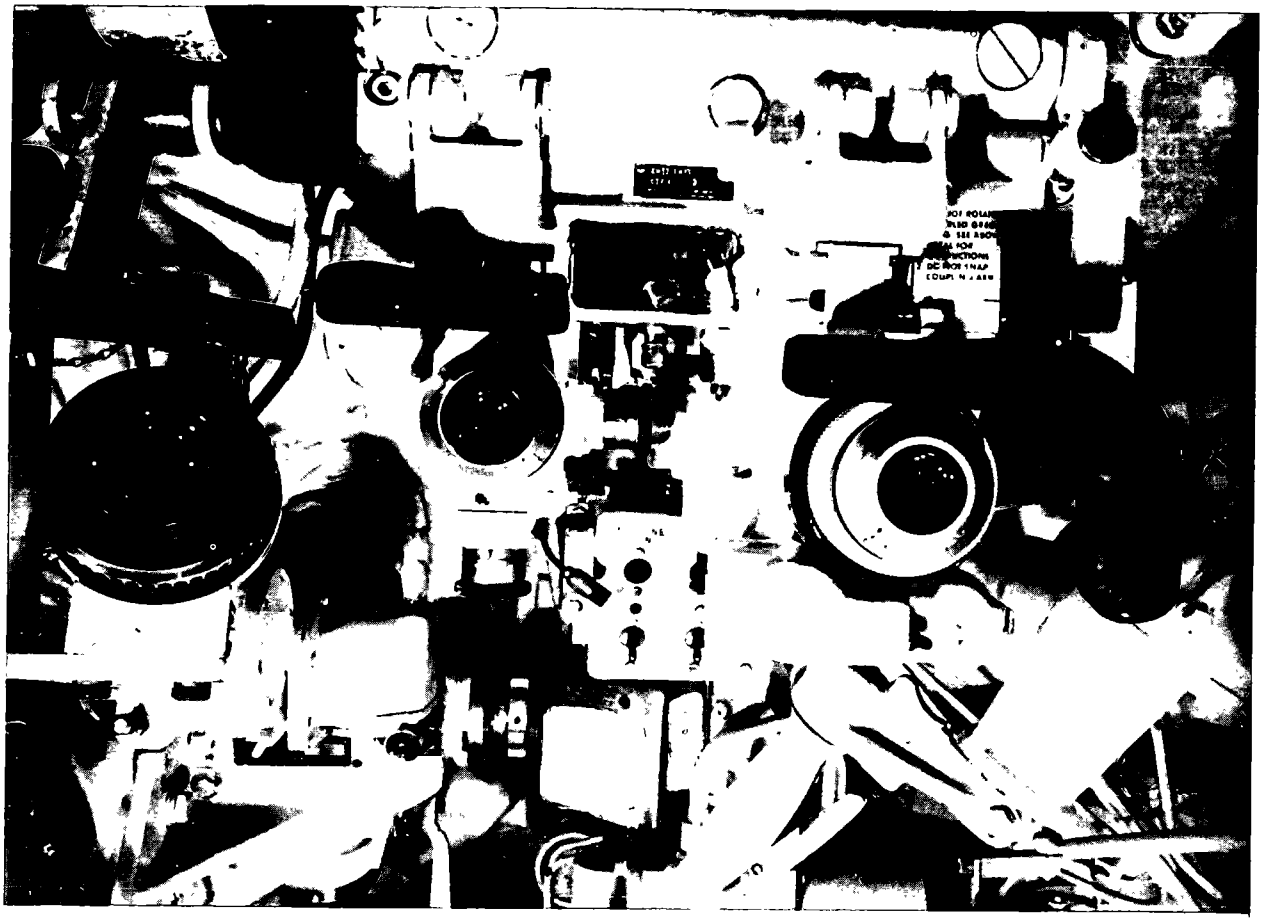


Figure E–3. Periscope, tank commander's, M–36.

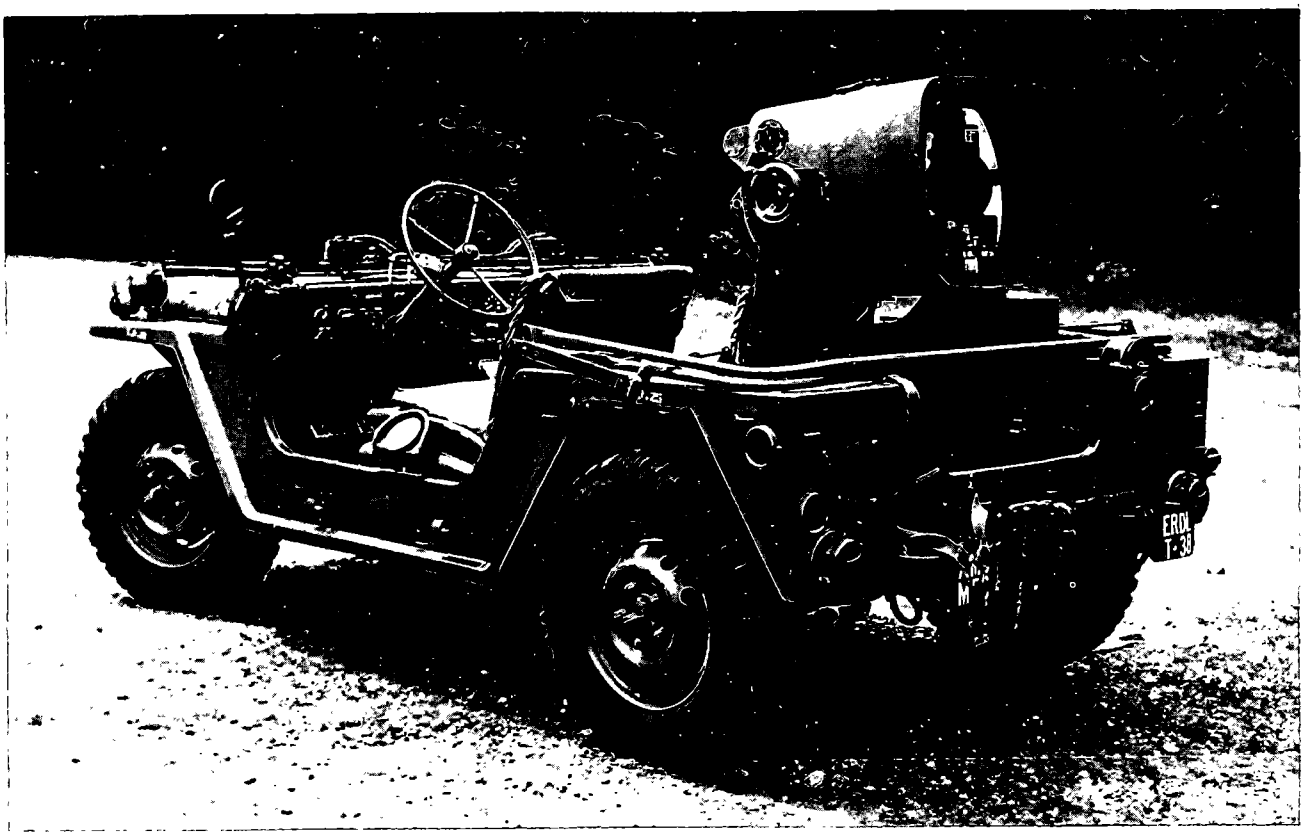


Figure E–4. Searchlight, infrared, AN/MSS–3 mounted on a ¼-ton truck.

APPENDIX F
M–18 BINOCULAR

F–1. Description and Use

The M–18 binocular (fig. F–1) is a handheld infrared binocular developed as part of the tank night vision kit. It permits secure open hatch observation by the tank commander. Although it was designed as a part of the tank kit, the binocular can be used with any infrared light source for observation with visual security.

F–2. Characteristics

a. Field of View—12°.
b. Magnification—3.5X.
c. Weight—4.75 pounds.
d. Battery.
(1) Type—1.5 disposable mercury battery.
(2) Life—40 hours continuous use.
e. Federal Stock Number 6650–863–5657.

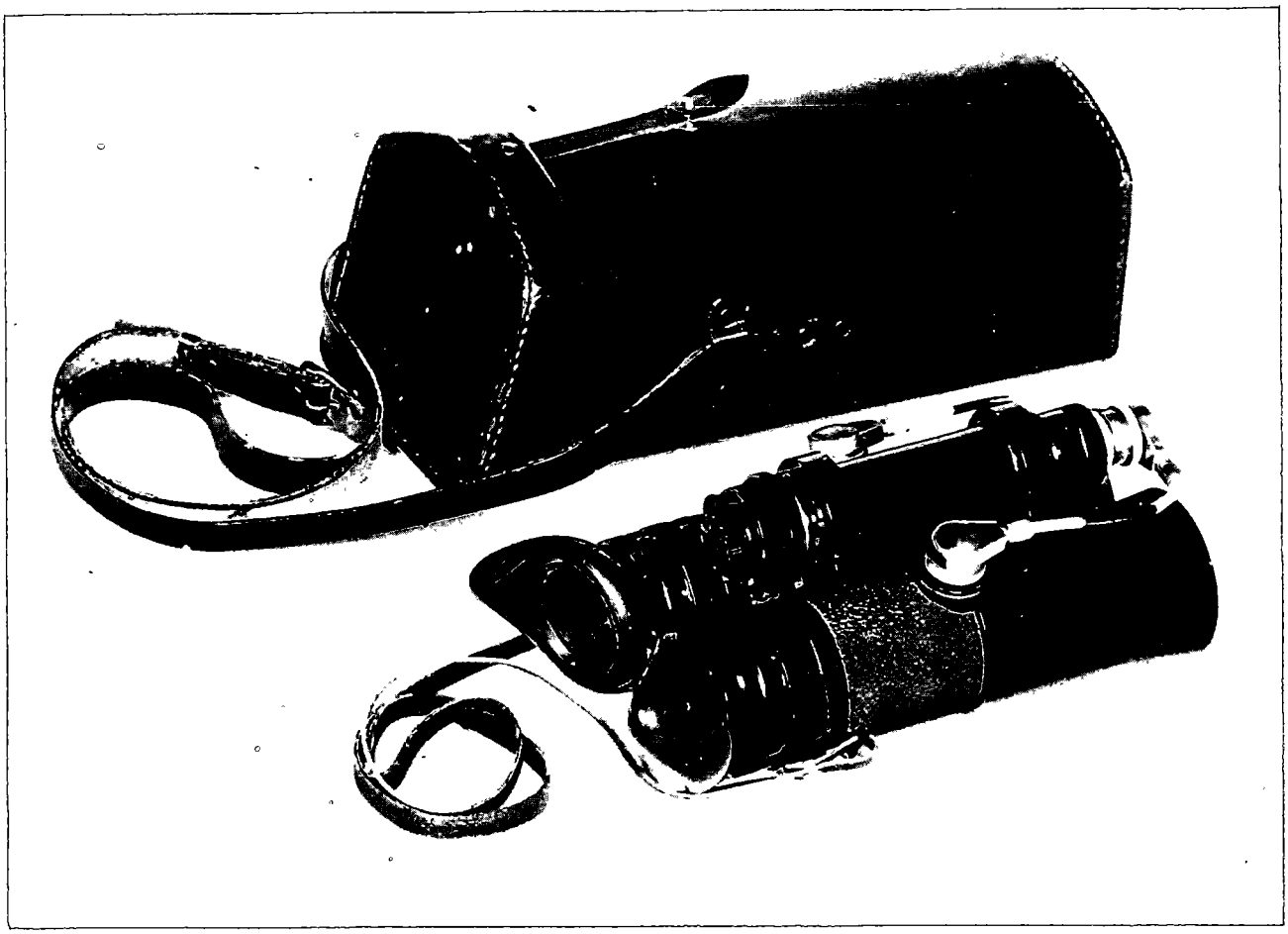


Figure F–1. M–18 binocular.

APPENDIX G
NIGHT VISION SIGHT, INDIVIDUAL WEAPONS MOUNTED, AN/PVS–1 OR AN/PVS–2 (STARLIGHT SCOPE)

G–1. Description and Use

a. General. The Night Vision Sight, Individual Weapons Mounted, (commonly referred to as the Starlight Scope) (AN/PVS–1 or AN/PVS–2) is a portable, battery-powered, electro-optical instrument for passive visual observation and aimed fire of weapons at night (fig. G–1). It uses the natural light (moonlight and/or starlight) of the night sky for target illumination. The starlight scope, since it does not project a visible or infrared light is a passive device and offers freedom from the possibility of enemy detection. The AN/PVS–2 affords an improved viewing capability over the AN/PVS–1.

b. Weapons. The starlight scope is designed for employment on the M14, M14A1, and M16E1 rifles, the M60 machinegun, the 40-mm grenade launcher M79, the 66-mm rocket launcher M72, and the 90-mm recoilless rifle M67.

c. Employment. The starlight scope is capable of employment as a handheld viewer or weapon mounted sight on the basic infantry weapons described in G–1, above. Its use at night permits weapons accuracy comparable to that obtained with the weapon in daylight using the conventional sight. It can also be used as a handheld viewer by commanders, reconnaissance units, and personnel engaged

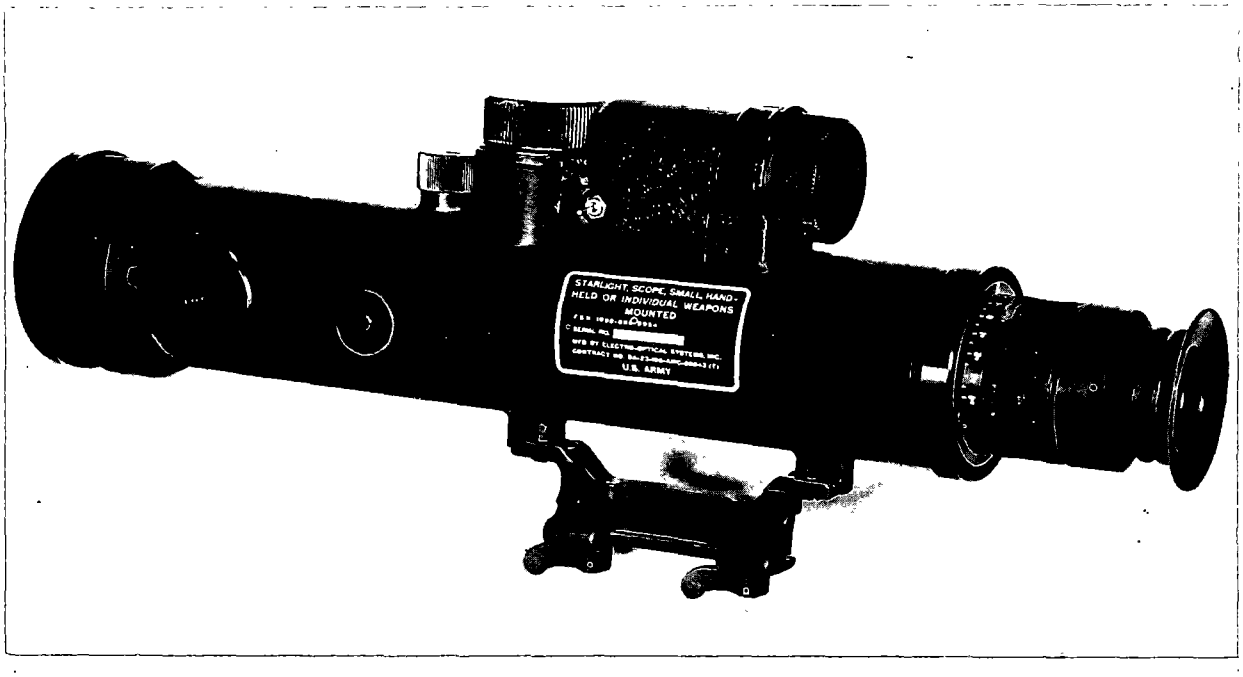


Figure G–1. Night vision sight, individual weapons, AN/PVS–1 (not mounted).

in offensive and defensive operations. Undesirable conditions of light, darkness, weather and terrain limit its employment. Low light level, rain, fog, smoke and dust reduce its viewing range.

G–2. Characteristics

a. Range—Dependent on ambient light level.

b. Field of View—10.4° (185 mils).

c. Magnification—4X.

d. Total weight—AN/PVS–1,5.82 pounds; AN/PVS–2,6 pounds.

e. Length—AN/PVS–1,18.5 inches; AN/PVS–2, 17.5 inches.

f. Eyepiece focus—adjustable.

g. Battery for high voltage power supply—6.75 volt mercury (disposable).

h. Battery life—100 hours continuous operation.

i. Federal Stock Number.

(1) AN/PVS–1 5855–087–2942

(2) AN/PVS–2 5855–087–2947

G–3. Reference

a. TM 11–1090–268–13 (Model AN/PVS–1).

b. TM 11–5855–203–13 (Model AN/PVS–2).

c. TC 23–11.

APPENDIX H
INFRARED WEAPONSIGHT

H–1. Description and Use

The infrared weaponsight (fig. H–1) is a battery operated sight, aiming, and detecting device. It consists of an infrared light source and a near infrared sensitive image forming telescope with attached reticle projector, an integral high voltage power supply, and a light source power supply. The primary purpose of the infrared weaponsight is to provide accurate and visually secure night firing for all basic infantry weapons. It can also be used to provide countermeasure aid in detecting enemy use of infrared light sources, and as a general purpose infrared surveillance telescope. This weaponsight is designed for rapid mounting on the M14 and M16E1 rifle, the M60 machinegun, and the 90-mm recoilless rifle. The high voltage power supply, utilizing a 1.5-volt C cell for the viewer, is self-contained in the viewer housing. The weaponsight permits the delivery of very accurate aimed small arms fire at night without the use of any visible light.

H–2. Characteristics

a. Viewing Range—250 meters.

b. Field of View—8°.

c. Magnification—4.5X.

d. Weight—4-pound viewer, 1-pound source, and 6-pound battery pack.

e. Battery life.

(1) Light source—5 hours continuous use.

(2) Viewer—40 hours continuous use.

f. Federal Stock Number 1090–797–8217.

H-3. Reference

TM 5–1090–200–15.

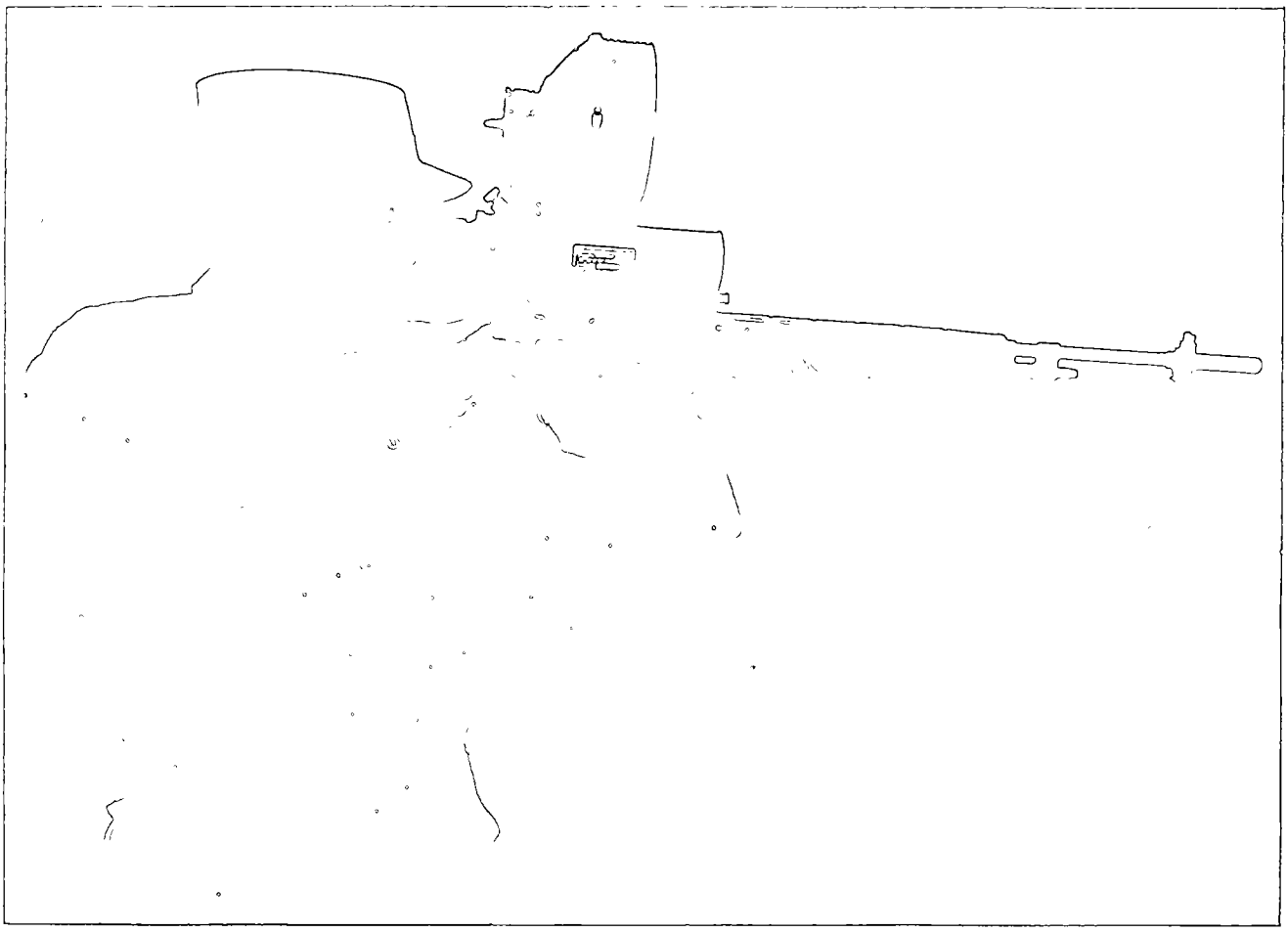


Figure H-1. Infrared weaponsight.

APPENDIX I

NIGHT VISION SIGHT, CREW SERVED WEAPONS, AN/TVS–2

I–1. Description and Use

The crew served weapon night vision sight is a battery-powered, electro-optical device for observation and aimed fire of crew served weapons at night. The sight is a passive instrument and uses the natural light (moonlight and/or starlight) of the night sky for target illumination. Since the sight does not project infrared or visible light, it offers freedom from the possibility of enemy detection. The sight is designed for employment on the Browning machine gun caliber .50 HBM2, and the 106-mm recoilless rifle M40A1 (fig. I–1).

I–2. Characteristics

a. Viewing Range—dependent on ambient light level (moonlight or starlight).

b. Field of View—108 mils.

c. Magnification—7X.

d. Weight (Sight and accessories in carry case)—approximately 47.50 pounds; scope, 16 pounds.

e. Battery life—approximately 100 hours.

f. Federal Stock Number 5855–911–1370.

I–3. Reference

a. TM 11–5855–202–13.

b. TC 23–13.

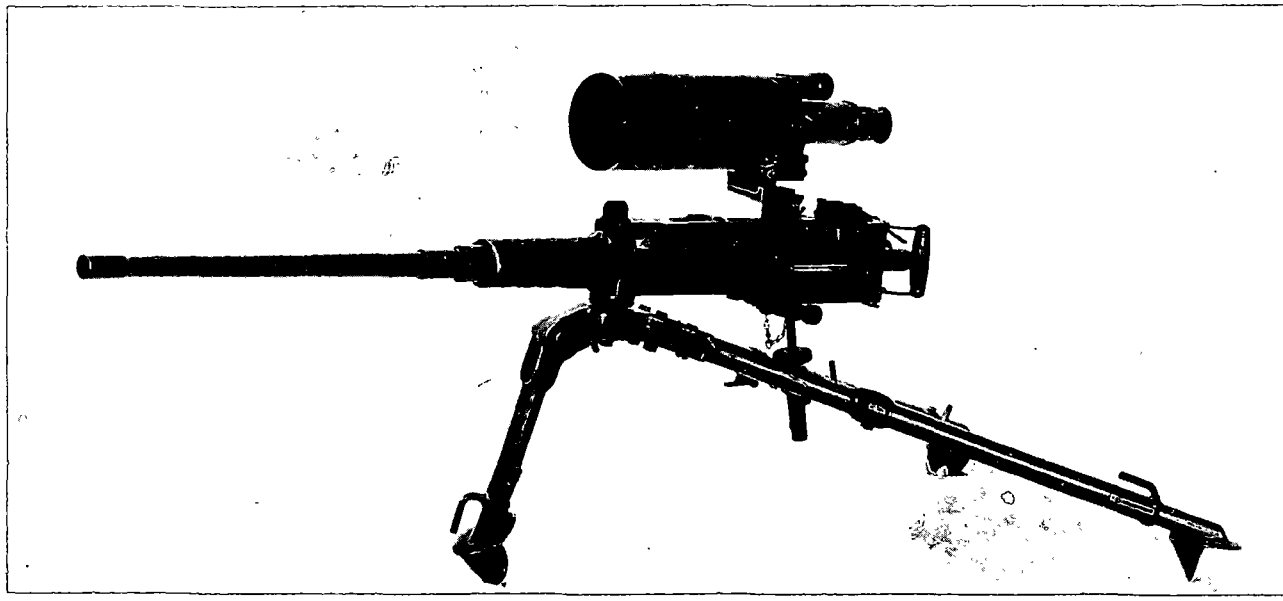


Figure I–1. Night vision sight, crew served weapons.

APPENDIX J

NIGHT VISION SIGHT, TRIPOD MOUNTED, AN/TVS-4 (NIGHT OBSERVATION DEVICE) (NOD)

J-1. Description and Use

The tripod mounted night vision sight (Night Observation Device) is a transportable, battery-powered, electro-optical instrument for passive visual observation of distant targets at night. It may be used by artillery forward observers at night in adjusting indirect fire; by outposts, listening posts, and forward observation posts to detect, locate, and identify enemy elements; and as a general night vision aid (fig. J-1). It is commonly referred to as the NOD.

J-2. Characteristics

a. Viewing Range—depending on ambient light level (moonlight or starlight).

b. Field of View—8°.

c. Magnification—7.5X.

d. Weight.

(1) Viewer weight—36 pounds.

(2) Tripod weight—12 pounds.

(3) Carrying case—22 pounds.

e. Battery—6.75V disposable mercury battery.

f. Battery life—100 hours continuous operation.

g. Federal Stock Number 5855-906-0994.

J-3. Reference

TM 11-5850-228-13.

Figure J–1. Night vision sight, tripod mounted, AN/TVS–4 (NOD).

APPENDIX K

SEARCHLIGHT, GENERAL PURPOSE, 30-INCH, AN/TVS–3

K–1. Description and Use

The 30-inch searchlight consists of two major components, the light itself with its control mounted on one trailer, and a gasoline engine driven generator on a second trailer. The searchlight uses a blown, carbon arc light source which can be operated continuously for approximately 6 hours. After a 5-minute delay to replace the negative disk carbon, operation of the searchlight can be resumed. The beam spread can be changed from 3¼° to 10° by the addition of a spread beam lens. The degree of illumination on the target is decreased by spreading the beam. The power source is a 20-KW dc generator. The 30-inch searchlight can illuminate the battlefield by direct light on the target; by indirect diffused, scattered light from a low beam; or by reflection from cloud cover. Diffused illumination, the most common employment, is usually bright enough to permit fire and movement, as this technique achieves an effect comparable to bright moonlight. The searchlight can be filtered and used as an infrared light source for very long range infrared viewing (fig. K–1).

K–2. Characteristics

a. Viewing Range—10,000 meters (indirect employment).

b. Beam Spread—3¼° to 10°.

c. Peak Beam Candlepower—400 million.

d. Weight—1,200 pounds, searchlight and trailer.

e. Operating Time—6 hours per disc.

K–3. Reference

TM 11–6230–220–12.

Figure K–1. Searchlight, general purpose, 30-inch.

APPENDIX L
LIGHT, GLIDE ANGLE INDICATOR

L–1. Description

The light, glide angle indicator is a tricolor projection system to provide safe, glide slope approaches for rotary or fixed wing aircraft, in the vicinity of the frontlines. The projected beam is seen by the approaching pilot as yellow, green, or red, depending on his angle of approach. The light is air droppable and may be used along, or in conjunction with the light kit, marking, landing and drop zone. The unit is self contained, but may be used with an external 24–28 volt dc power supply if desired (fig. L–1).

L–2. Characteristics

a. Beam Width.
  (1) Horizontal—14° total.
  (2) Vertical—15° total.
b. Visibility Range—25 miles at night.
c. Weight—26 pounds.
d. Battery life—8 hours.
e. Lamp life—10 hours.

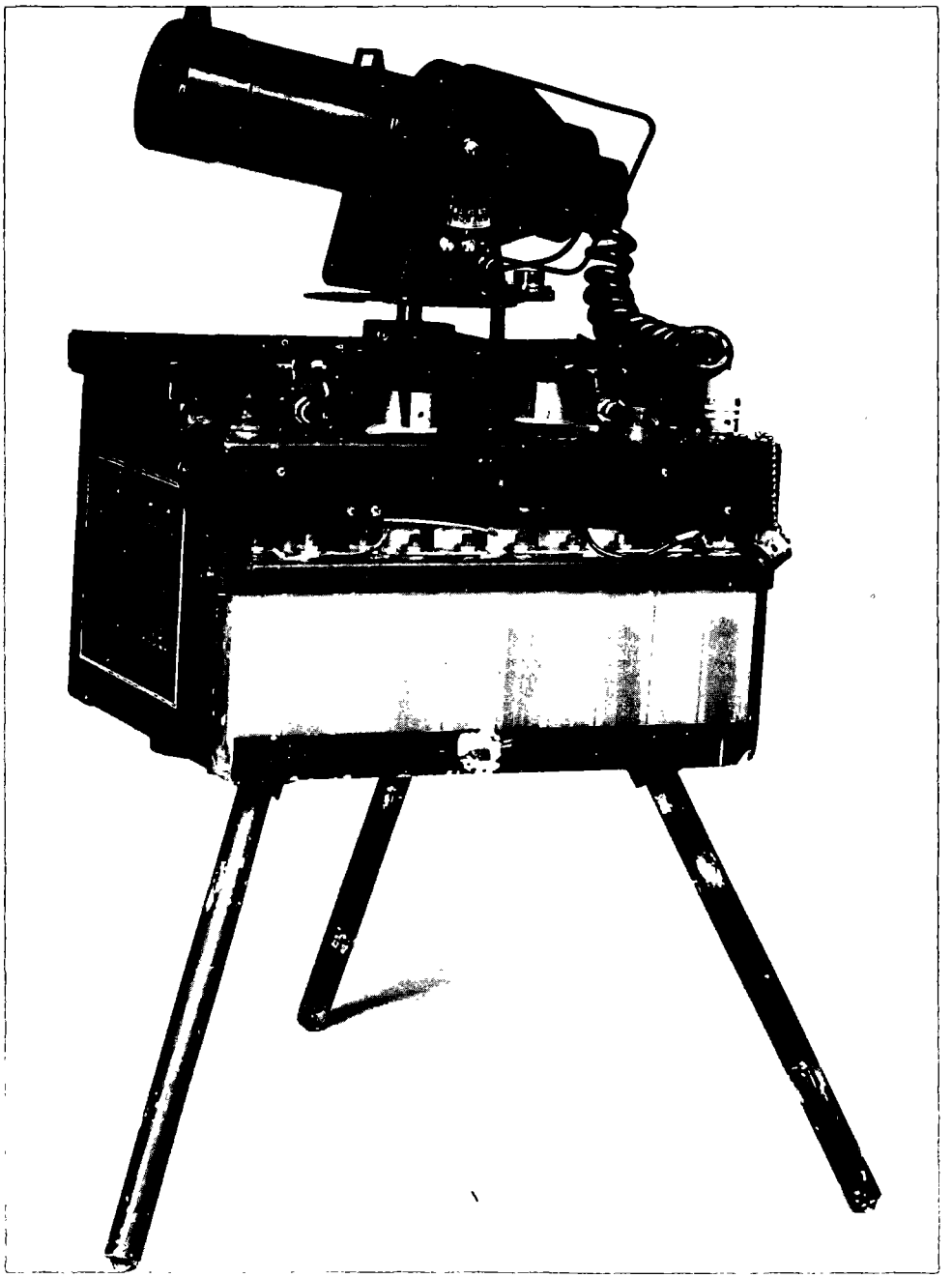


Figure L–1. Light, glide angle indicator.

APPENDIX M

BEACON LIGHT, PATHFINDER, AN/TVN–2

M–1. Description

The beacon light, pathfinder (fig. M–1) is a coded, ac, or battery powered light, for the purpose of aiding the assembly of troops and to accomplish terminal navigation of aircraft at night. It includes a collapsible mast, which may be extended to 23 feet, and a series of interchangeable lenses, which will provide infrared, clear, red, green, yellow, or blue light. The lamp may be operated continuously or may be arranged to give a flashing morse code signal. The unit is airdroppable.

M–2. Characteristics

a. Viewing Range (with image metascope).
  (1) IR—2 miles.
  (2) Visible—5 miles.
b. Weight—25 pounds.
c. Battery life—2 hours.
d. Lamp life—10 hours.
e. Federal Stock Number 6210–226–5695.

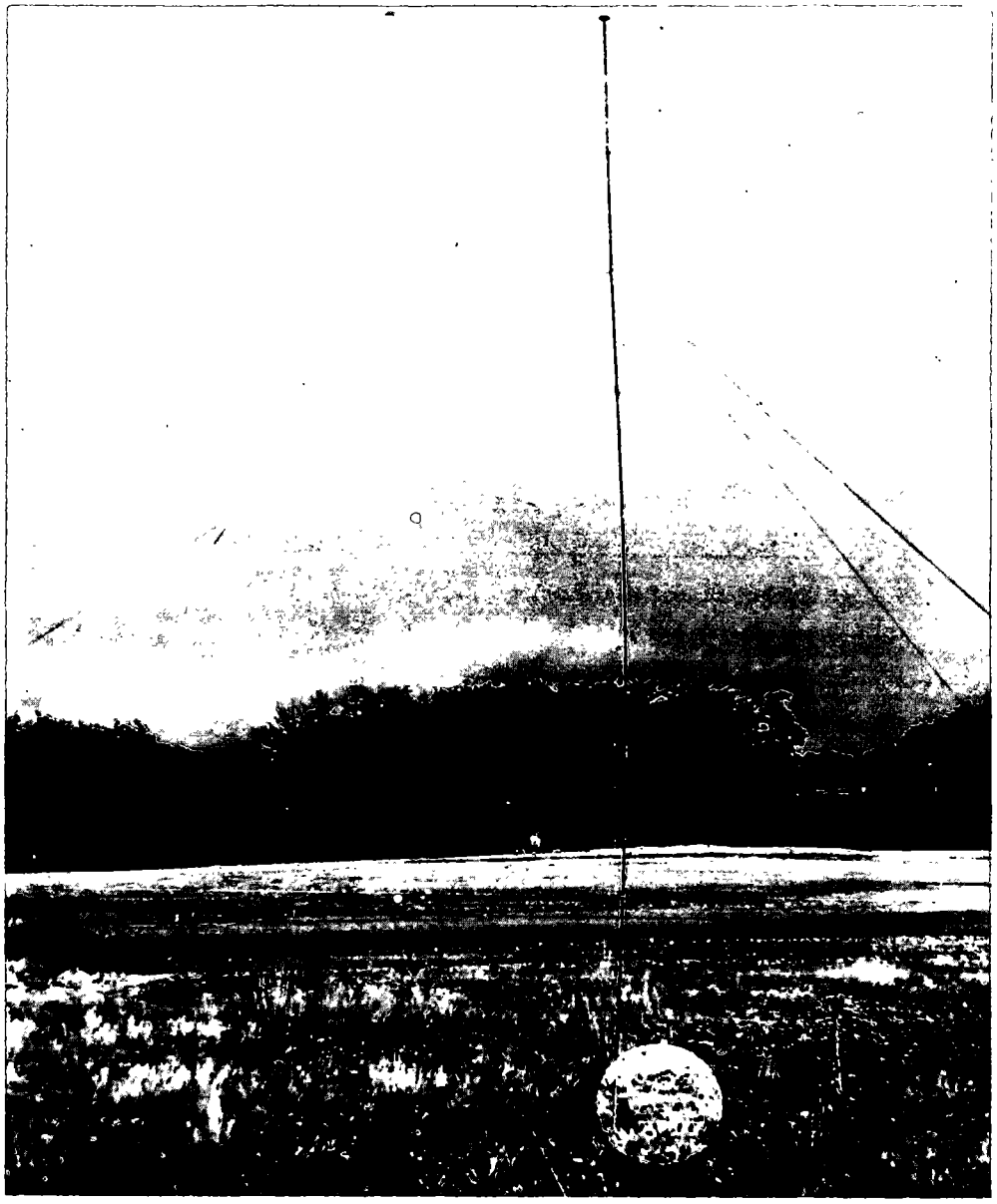


Figure M–1. Light, beacon pathfinder, AN/TVN–2.

APPENDIX N

RADAR SET, AN/PPS–4

N–1. Description

The Radar Set AN/PPS–4 (fig. N–1) is a lightweight, partially transistorized, portable radar set designed primarily for short range ground surveillance. It uses a 24-volt dc power source by battery BB–442/U or generator set PU–532/PPS–4.

N–2. Characteristics

The AN/PPS–4 is capable of searching for, detecting, and locating moving targets such as personnel and vehicles within a radius of approximately 80 to 6,000 meters. The AN/PPS–4 utilizes the doppler principle to detect moving targets, and information regarding the range, azimuth, and elevation of the targets is shown on the range indicators of the control panel and on the azimuth and elevation dials of the tripod. Target identification is based on the audio-tones the operator receives.

a. Range.

(1) Maximum—8,000 meters, large moving target,
1,500 meters, moving personnel.

(2) Minimum—80 meters.

(3) Accuracy—±25 meters.

b. Type—Noncoherent doppler principle.

c. Type target indications.

(1) Moving—Characteristic audio-tones.

(2) Large stationary—Deflection of needle on range tension meter.

d. Azimuth.

(1) Coverage—0–6,400 mils traverse.

(2) Accuracy—±10 mils.

(3) Section scan—540 mils.

(4) Type coverage—Manual only.

e. Elevation.

(1) Coverage—±350–800 mils.

(2) Accuracy—±10 mils.

(3) Frequency—8900—9400 MHZ.

f. Weight—approximately 115 pounds.

g. Federal Stock Number 5840–682–2591.

N–3. Reference

TM 11–5840–211–12.

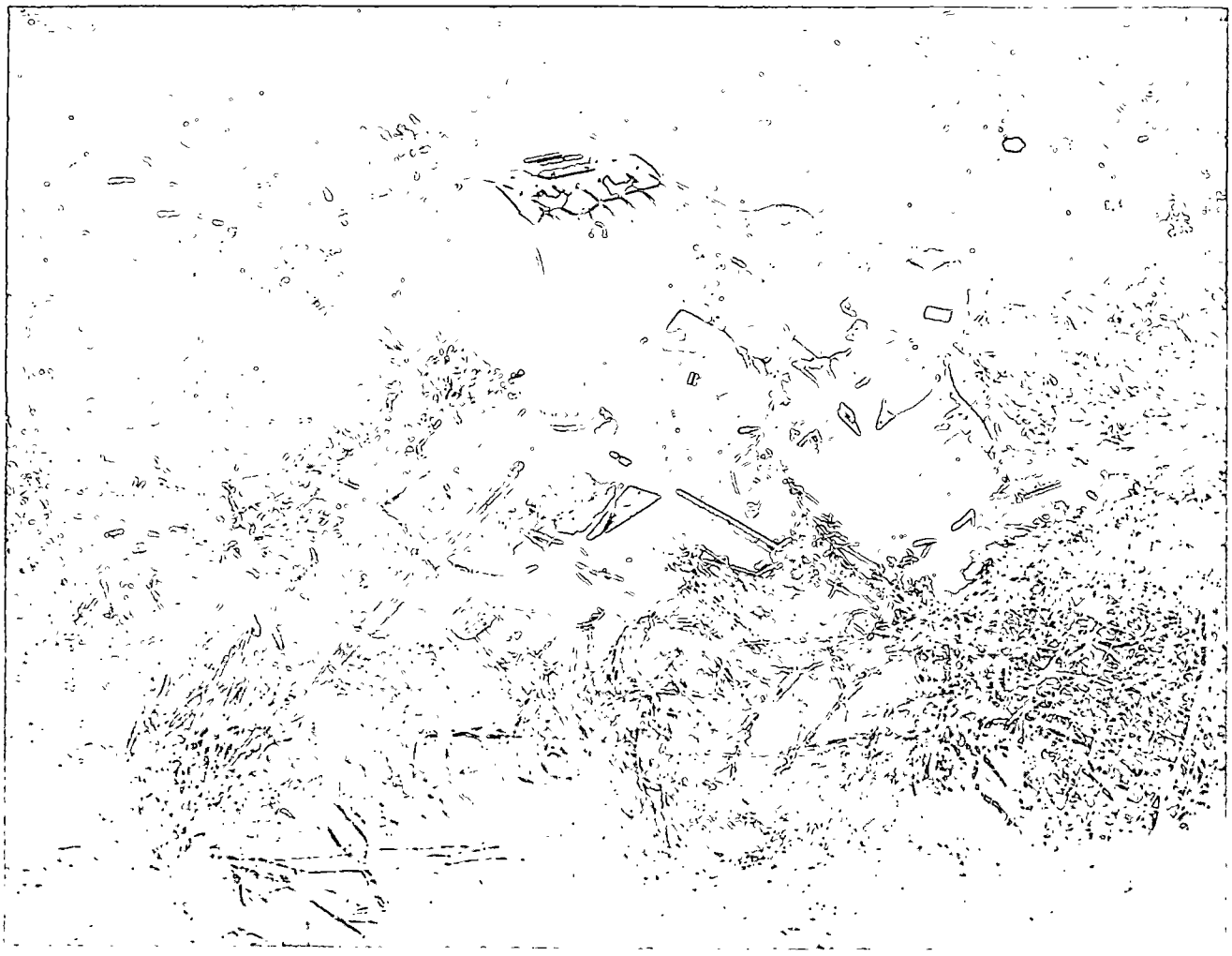


Figure N–1. Radar set, AN–PPS–4.

APPENDIX O
RADAR SET, AN/PPS–5

O–1. Description

The Radar Set AN/PPS–5 (fig. O–1) is a lightweight, man-portable, partially transistorized radar set designed for detection of moving targets at short range. It uses a 6-volt dc power source or it can be converted to operate on a 24-volt dc power source.

O–2. Characteristics

a. The set is capable of searching for, detecting, and locating moving ground targets. The radar can be operated from the antenna location or remotely operated up to 50 feet from the antenna. Primary target detection and identification is by an audible tone when a moving target is within the range gate. Visual detection is possible from the remote unit, with an A-scope providing detection in range and a B-scope detection in azimuth. Range is presented by a counter reading in meters. Azimuth and elevation are presented by counters in mils. Weight is 98 pounds.

b. Ranges.

(1) Moving vehicles—10,000 meters maximum.

(2) Moving vehicles—50 meters minimum.

(3) Moving personnel—6,000 meters maximum.

(4) Moving personnel—50 meters minimum.

(5) Accuracy—±20 meters.

c. This set will replace the AN/PPS–4 and the AN/TPS–33.

d. Federal Stock Number 5840–99–7649.

O–3. Reference

TM 11–5840–298–12.

Figure O–1. Radar set, AN/PPS–5.

APPENDIX P

RADAR SET, AN/MPQ–10A

P–1. Description

The radar set AN/MPQ–10A (fig. P–1) is a transportable radar set designed to locate and track mortar and artillery projectiles. The radar set consists of four major assemblies: the tracker mount which contains radar set components; radar set control CU–869/MPQ–10; recorder RD 54/TP; and power unit PU–26/U (not supplied). Power input 115V ac, 60 cps, 3-phase, 5KVA maximum.

P–2. Characteristics

The radar set can be used with associated recording equipment to locate the points of origin and impact of mortar and artillery projectiles. The radar set is used primarily with associated recording equipment as a counter-mortar radar system and may also be used to detect and track aircraft. Components of the radar set generate radio frequency pulses which are radiated in a narrow beam. Pulses (echoes) reflected from objects (projectiles) located within the beam are displayed on two oscilloscopes. When a projectile echo is displayed on the oscilloscopes, the azimuth and elevation of the projectile at that point in space is indicated on the dials. The coordinates of the weapon (mortar or artillery piece) are determined by extrapolating azimuth and range data from the recorder RD–54.

a. Range—20,000 yd maximum, 500 yd minimum.

b. Range accuracy—150–400 meters.

c. Elevation coverage.

(1) Lower limit—−125 mils.

(2) Upper limit—+1,540 mils.

d. Azimuth.

(1) Coverage—6,400 mils traverse.

(2) Azimuth or elevation accuracy—1–5 mils probable error.

(3) Sector beam width—200–800 mils, adjustable.

e. Automatic tracking rates.

(1) Elevation—200 mils/sec maximum

(2) Azimuth—350 mils/sec maximum

(3) Slant Range—1,000 yd/sec maximum

f. Manual tracking rates.

(1) Elevation—650 mils/sec maximum

(2) Azimuth—850 mils/sec maximum

(3) Slant Range—2,500 yd/sec maximum

g. Federal Stock Number 5840–378–5006

P–3. Reference

a. TM 750–5–4.

b. TM 11–1303.

c. TM 11–1303 ESC.

d. TM 11–1503.

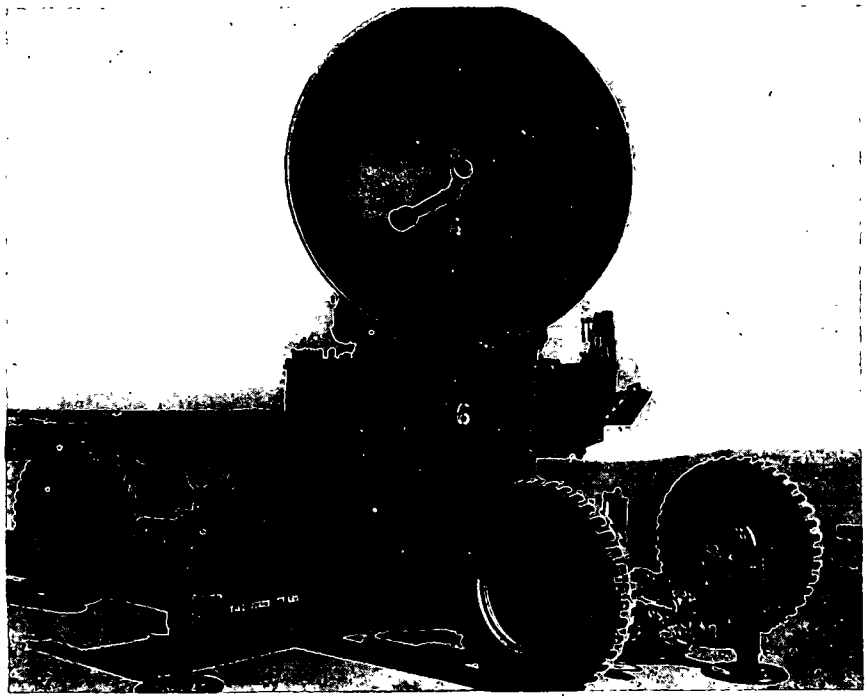


Figure P-1. Radar set, AN/ MPQ-10A.

APPENDIX Q
RADAR SET, AN/TPS-33

Q-1. Description
The radar set AN/TPS-33 (fig. Q-1) is a lightweight, man-packed, portable radar that is designed primarily for medium range ground surveillance. It uses a combination 115-volt ac, 400 cycle and 28-volts dc power source from generator set PU-422/U.

Q-2. Characteristics and Data
The set is capable of searching for and detecting moving ground targets, such as personnel and vehicles within a radius of 91 to 18,280 meters. It is also capable of detecting certain stationary features. The AN/TPS-33 utilizes the doppler principle to detect moving targets and depicts range, azimuth, and elevation to the target on a combination of counters, range scales, and meters. In addition, the AN/TPS-33 depicts the target on an A-scope. Target identification is based on the audio tones the operator receives. Weight with and without carrying case is 660 pounds and 320 pounds, respectively.

a. Range.
(1) Maximum—18,280 meters.
(2) Minimum—91 meters.
(3) Accuracy—±23 meters or 1 percent of range, whichever is greater.

b. Type Target Indications.
(1) Moving—Characteristic audio tone in operator's headset and a characteristic pip on the A-scope.
(2) Stationary—Characteristic pip on the A-scope.

c. Azimuth.
(1) Coverage—0–6400 mils continuous.
(2) Accuracy—±25 mils.
(3) Type coverage—Manual or automatic.
(4) Section scan—600–2200 mil sectors or continuous 6,400 mil rotation.
(5) Elevation.
(*a*) Coverage—±350 mils.
(*b*) Accuracy—±25 mils.

d. Federal Stock Number 5840-752-5293.

Q-3. Reference
TM 11-5840-229-15.

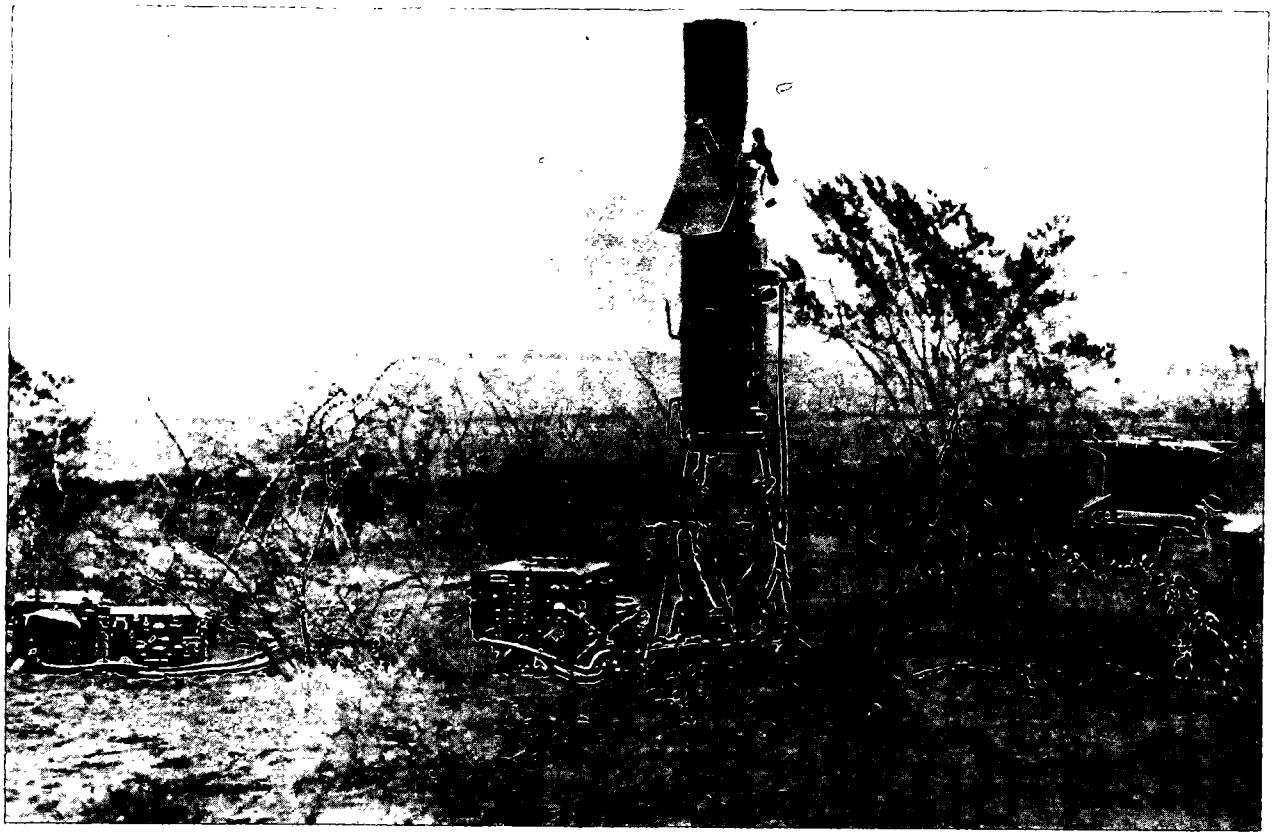


Figure Q–1. Radar set, AN/TPS–33.

APPENDIX R
RADAR SET, AN/MPQ–4A

R–1. Description

Radar Set, AN/MPQ–4A, (fig. R–1) is a mobile, pulse modulated, nontracking, dual-beam, beam intercept radar. The complete set, with its associated equipment, is contained in two trailers, the radar trailer and the power unit trailer. The antenna group, receiver-transmitter group, dehydrator, and control-indicator group are mounted on the radar trailer. This trailer provides a means for transportation and a platform for operation. The power unit PU–304/MPQ–4A consists of a 1½-ton trailer on which a power unit PU–107A/U is mounted. The power unit provides 120/208 volt, 400-cycle, 3-phase power required for operation of the radar.

R–2. Characteristics

The set can be used to locate mortars and other high trajectory weapons, observe registration, adjust fire, and detect and locate moving targets.

a. Ranges.
  (1) Maximum—10,000 meters.
  (2) Minimum—170 meters.
  (3) Accuracy—±10 meters.
  (4) Resolution—50 meters.

b. Azimuth.
  (1) Coverage—6,400 mils.
  (2) Accuracy—1.5 mils.
  (2) Accuracy—±1.5 mils.

c. Elevation.
  (1) Coverage—−100 to +200 mils.
  (2) Accuracy—±1 mil.

d. Rounds required for location—one.

e. Accuracy of location—0–50 meters.

f. Weight—6,000 pounds.

g. Federal Stock Number 5840–543–0759.

R–3. Reference

a. TM 11–5840–208–10.

b. FM 6–161.

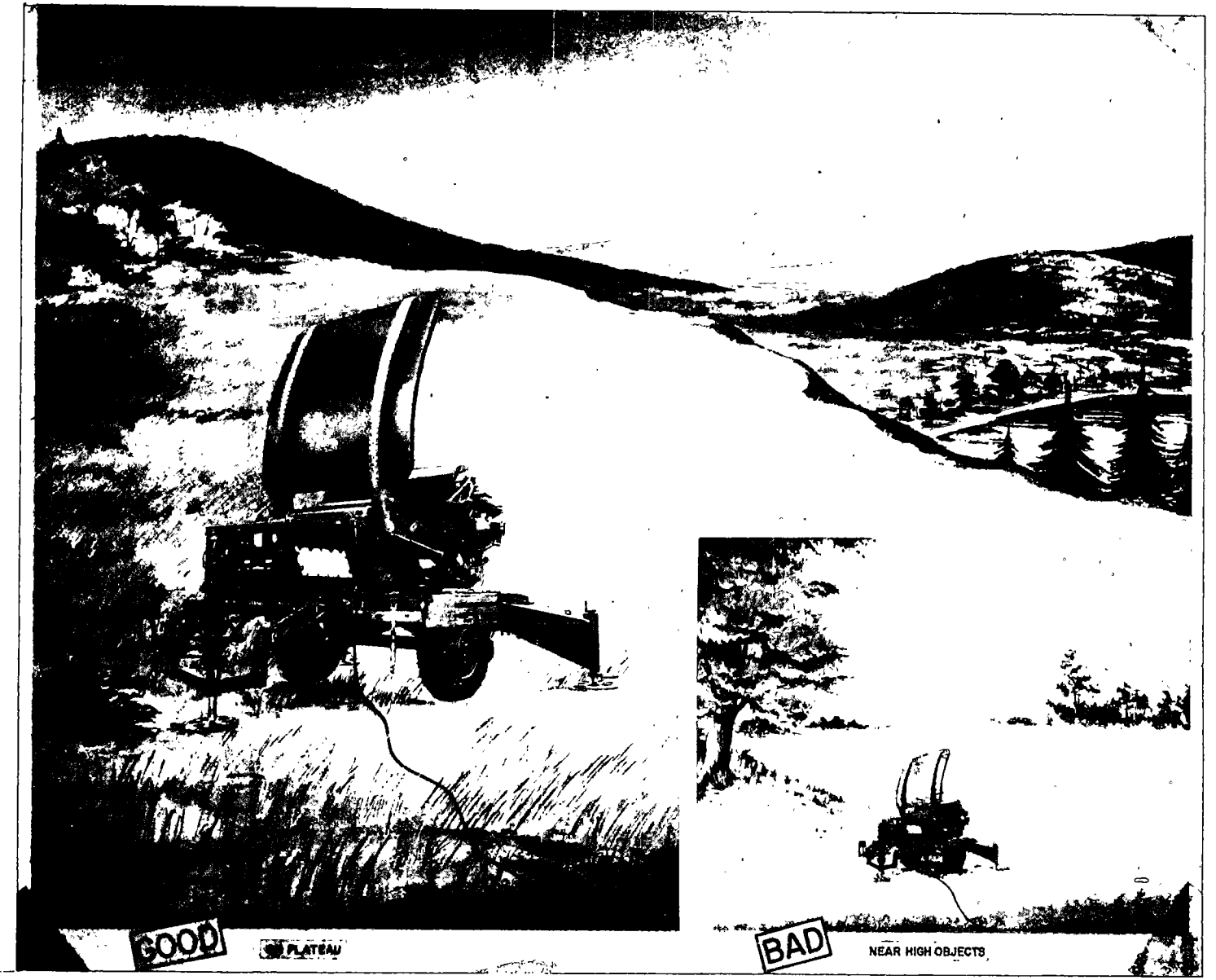


Figure R-1. Radar set, AN/MPQ-4A.

APPENDIX S
RADAR SET, AN/TPS–25

S–1. Description

The Radar Set AN/TPS–25 (fig. S–1) is a transportable battlefield surveillance radar. The set is mounted in Electrical Equipment Shelters S–124/G. All components of the set are secured within the shelters during transit to prevent damage. Quick release latches for rapidly removing the units of the radar set for remote operation outside the shelter are provided. Mounting brackets for the operation of the coordinator, plotting board, and associated components within the shelter are also provided. Power source required for operation is 115± 5% ac, 400 ± 5% cy, single phase.

S–2. Characteristics

The set is designed to detect the presence of moving ground targets and supply information as to their location. Several modes of operation are provided which enable the radar set to first detect, then accurately locate a moving target. The various capabilities of the radar are—azimuth and range searching; tracking; and artillery fire surveillance.

a. Type—X-brand, noncoherent, doppler type.

b. Peak X- and Y-ground range coordinate errors—57 at 900M, 72 at 4,500M, 98 at 9,000M, and 140 at 18,280M.

c. Azimuth Coverage.

(1) With plotting board—Any predetermined 3,200 mil sector.

(2) Automatic search sector scan—180, 360, or 540 mils.

(3) Accuracy—+2½ mils in winds up to 25 mph.

(4) Azimuth determination — Counter reading correlated with peak audio response as shown on oscilloscope or heard on loudspeaker and/or headset.

d. Maximum range.

(1) 18,280 meters for moving vehicles (jeep size).

(2) 4,500 meters for a moving man.

e. Minimum range—450 meters.

f. Range determination—Counter reading correlated with first audio response heard either on loudspeaker and/or headset or as shown on oscilloscope.

g. Range resolution—250 ft (all ranges).

(1) Peak ground range errors—49 at 900M; 49 at 4,500M; 58 at 9,000M; 75 at 18,280M.

(2) Azimuth resolution—Resolves target separated in azimuth by one beam width.

h. Elevation coverage limits—±265 mils from horizontal.

i. Elevation determination—Counter reading correlated with peak audio response as shown on oscilloscope or heard on loudspeaker and/or headset.

j. Presentation.

(1) Visual—Counter indicators, plotting board, and cathode ray tube.

(2) Aural—Headset and/or loudspeaker.

k. Horizontal beam width.

(1) Search—10°.

(2) Track—2°.

(3) Vertical beam width—4°.

l. Polarization.

(1) 10° beam—Vertical.

(2) 2° beam—Horizontal.

m. Federal Stock Number 5840–752–7113.

S–3. Reference

TM 11–5840–217–10, –20.

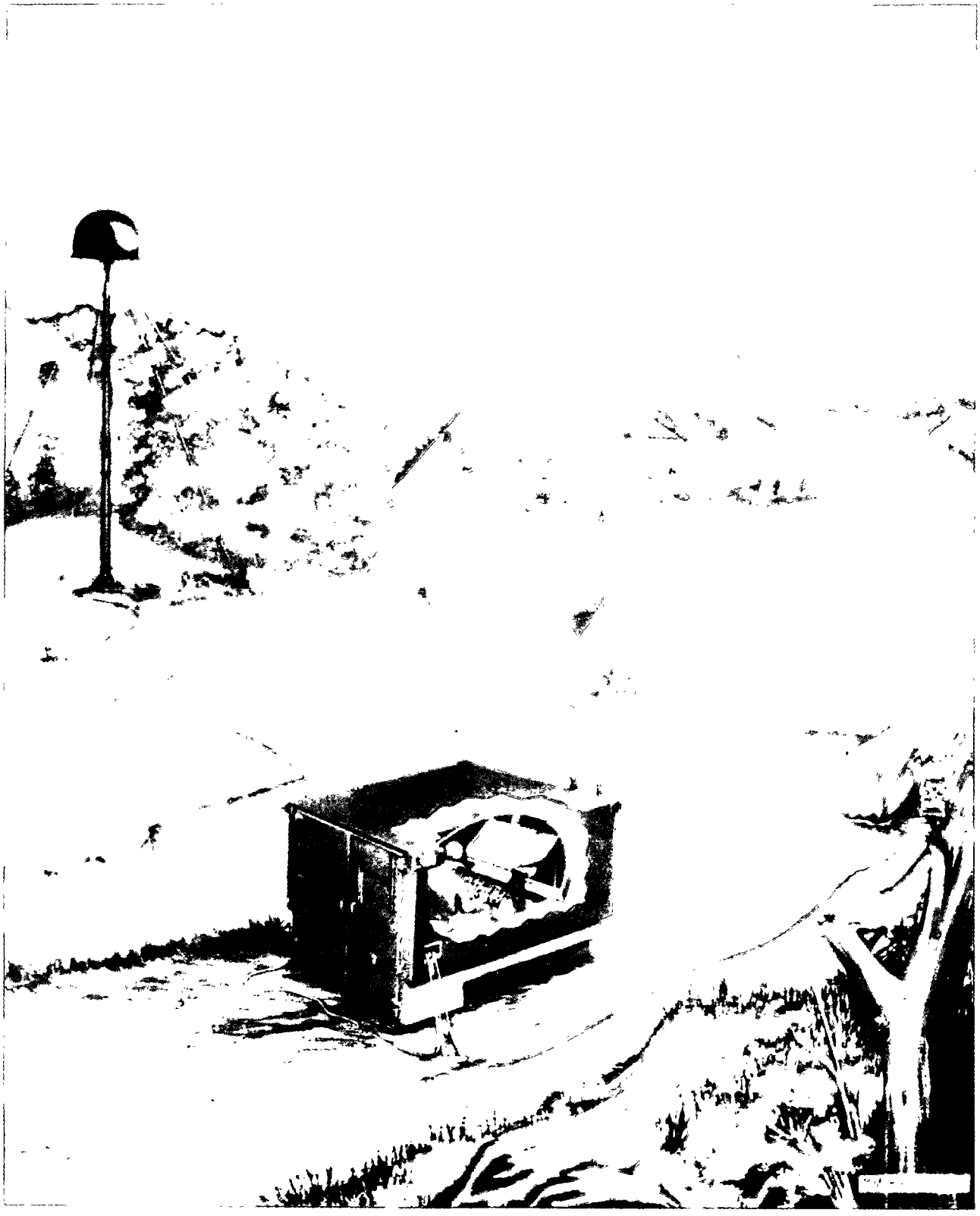


Figure S–1. Radar set, AN/TPS–25.

APPENDIX T

RADAR SURVEILLANCE SETS, AN/APS–94, 94A, 94B, AND 94C

T–1. Description

Radar Surveillance Sets AN/APS–94 (fig. T–1) are side-looking airborne aerial (SLAR) sets that provide a permanent aerial photoradar map of terrestrial (ground) targets to ranges of 25, 50, or 90 kilometers (KM) on either or both sides of the aircraft in which they are installed. The AN/APS–94B and AN/APS–94C radar sets provide additional information on the radar maps in the form of aircraft present position data (PPD). The aircraft's present position is indicated in numeric form (representing N–S/E–W coordinates relative to a fixed reference point) printed at the edge of the radar map. To provide this PPD data, the AN/APS–94B and AN/APS–94C require auxiliary equipment to furnish navigational data and perform data conversion functions. If in-aircraft readout (near real time) is desired, the camera-type recording provided by the AN/APS–94 recorder, recorder-processor-viewer RO–166 ( )/UP (not a part of the AN/APS–94) may be used. The RO–166 ( )/UP is directly interchangeable with the AN/APS–94 recorder and continuously presents the developed film map to the observer approximately 2 minutes after the aircraft has mapped the area.

T–2. Characteristics

a. Dsiplay method—Intensity modulated CRT tracers optically transferred to film-type recorder.

b. Recorder type—Dual (m and ft) 5-inch films (RO–225/APS–94) or auxiliary RO–166/UP which has single 9-inch film.

c. Type data recorder—flight information such as ground speed, drift angle, heading; mission data; fixed-target maps, moving-target maps, and aircraft present position data (PPD) (AN/APS–94B and C only).

d. Ranges—25, 50, or 90 KM.

(1) Range delay (selectable)—10, 20, 30, 40, 50 and 60 KM.

(2) Range marks—every 20 KM.

e. Mapping velocity—150 to 300 knots.

T–3. Reference

TM 11–5895–284–12.

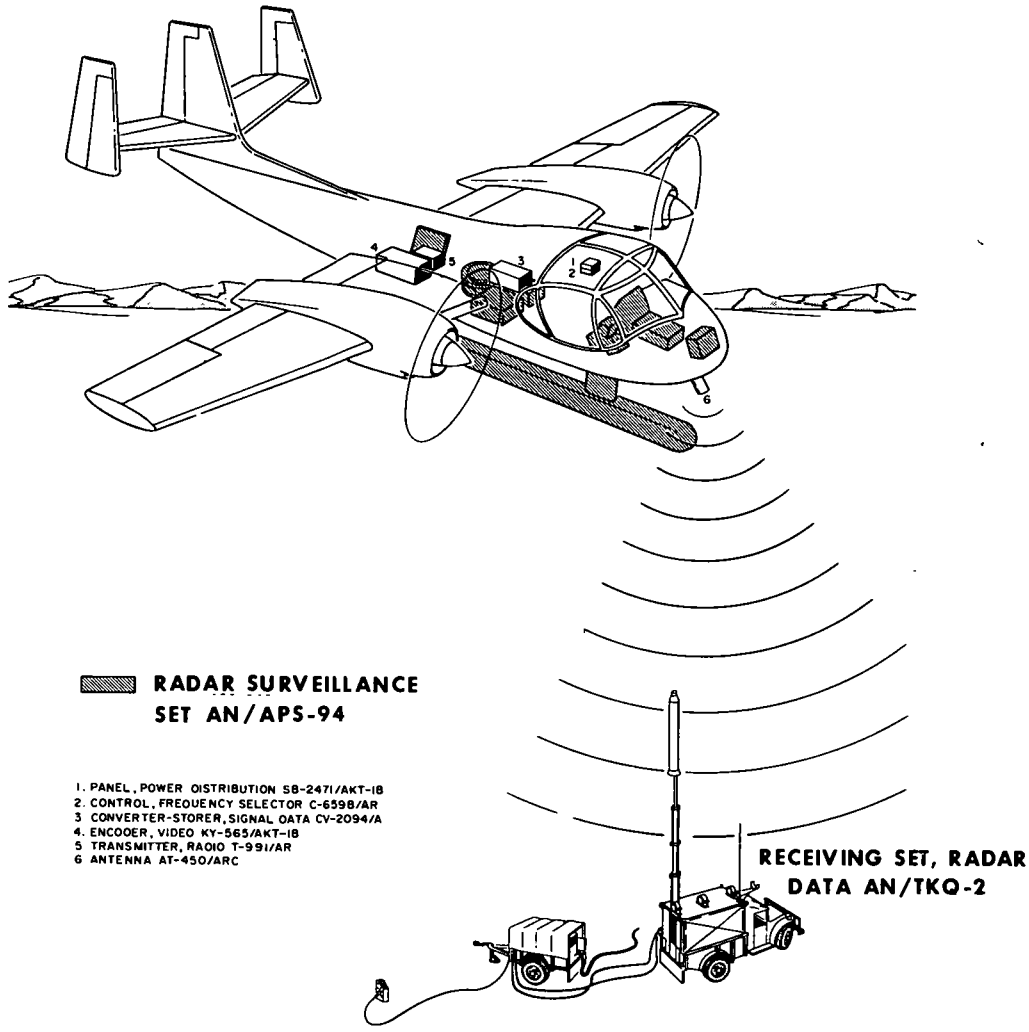


Figure T–1. Radar surveillance set, AN/APS–94.

APPENDIX U
SOUND RANGING SET, GR–8

U–1. Description

Sound Ranging Set, GR–8 (fig. U–1), is designed to locate the position of artillery by measuring the relative times at which a sound wave, generated by the firing of an artillery piece, reaches a number of accurately located detection positions on the ground. The set can be used for location of hostile artillery and registration and adjustment of friendly artillery. The set consists of three functional elements—the detection posts (outposts); the microphone array; and the command post. Contact between the mircophone array and the command post may be by wire link, radio link (use of radio set, AN/TRC–20, not supplied), or a combination of both. Contact between the outposts and the command post is by wire link.

a. Outposts. Each outpost position includes a connection box (BE–71), an outpost switch (SA–45/G) and an outpost telephone (TA–1/PT).

b. Microphone Array. The microphone array consists of 4 to 6 microphone positions, and the associated components for each microphone.

c. Command Post.

(1) The command post consists of the plate supply-timer unit (PE–244–A), the recorder (BC–1337–(*)), command post telephone (TA–312/PT) and associated minor components required to operate and maintain the sound ranging system.

(2) After installation, the sound ranging system in conjunction with plotting devices (FM 6–122), locates the source of artillery fire or the area of shell detonation.

U–2. Characteristics

a. Operating Range. Approximately 10,000 meters width and 15,000 meters depth (optimum); depth of 28,000 meters at decreased accuracy.

b. Accuracy. Between 50 and 150 meters within operating depth of 15,000 meters.

c. Types of sound recorded. Artillery muzzle blast, artillery projectile detonations, and other heavy detonations.

d. Federal Stock Number 5895–240–4493.

U–3. Reference

a. TM 11–5895–213–10.

b. FM 6–122.

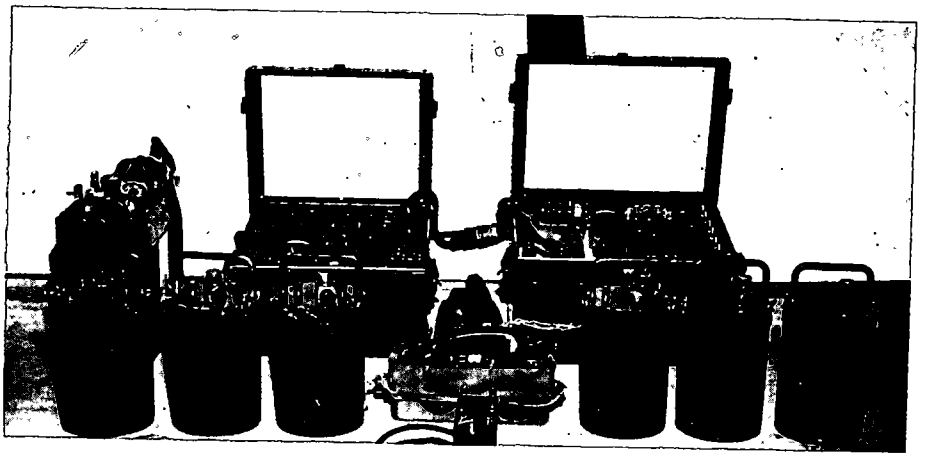


Figure U–1. Sound ranging set, GR–8.

APPENDIX V

ALARM SET, ANTI-INTRUSION, AN/GSS–9

V–1. Description and Use

a. Alarm Set, Anti-Intrusion, AN/GSS–9 (fig. V–1). It includes one alarm box, three vials, breakwire (breakwire spools), and twelve shorting connectors. The alarm box is made of plastic and has a plastic cover that is secured by screws. It uses a transistorized, battery-powered, multivibrator oscillator, the output of which is amplified and fed selectively to either a small speaker or a miniature light. The oscillator is permitted to oscillate or prevented from oscillating by the action of a transistor switch, which in turn is controlled by the continuity or lack of continuity in the breakwire array itself. A function control turns the power on, selects the audio light alarm, and adjusts the audio level. The alarm box contains a receptacle for the plug-in breakwire spool; a receptacle for the battery; an electronic board that contains the circuitry, control and alarm devices, and a test switch for checking operation by simulating a break in the wire; and a metal clip for attaching the alarm box to a belt, pocket, or similar object.

b. Vial, Breakwire. The breakwire is prewound in a plug-in plastic spool from which it may be drawn easily. The spool contains 3,200 yards of wirepair (parallel bonded) (AWG No. 44 insulated). The spool also contains two metallic connections which connect the breakwire to the electronical circuit in the alarm box.

c. Shorting Connectors. Each shorting connector consists of two small wingnuts captive-mounted back-to-back on a screw.

V–2. Characteristics

Alarm Set, Anti-Instrusion, AN/GSS–9 (breakwire alarm) is intended for use during guerrilla and counterguerrilla operations to provide protective surveillance by giving an alarm to indicate intrusion into an area or passage through selected lines. The breakwire alarm provides an audio alarm or a light alarm when the protective array, which consists of a pair of fine wires laid in a suitable guard pattern, is broken by an intruder. A battery, not supplied as part of the alarm set, is needed to supply power for the set.

a. At temperatures of 10° F and above—Battery dry BA–30 (1.5 volt) (Federal Stock Number 6135–120–1020).

b. At temperatures of below 10° F—Battery dry BA–203–/U (1.5 volts) (Federal Stock Number 6135–809–2148).

c. Current consumption (milliamperes).

(1) Actuated—20 (audio), 12 (light).

(2) Standby—2 (audio), 2 (light).

d. Maximum speed of breakwire layout—40 miles per hour.

e. Federal Stock Number 6350–759–9845.

V–3. Reference

TM 11–6350–200–10.

Figure V–1. Alarm set, anti-intrusion, AN/GSS–9.

APPENDIX W

DETECTING SET, INTRUSION, AN/PSR–1

W–1. Description

a. Detecting Set, Intrusion, AN/PSR–1 (fig. W–1), consists of a control set, four seismometers, a headset, ground rod, canvas carrying bag, and manual.

b. The control set houses the seismic amplifier, audio oscillator, batteries, fuse, loudspeaker, and switching and test circuits. Input terminals on top of the control set accept lines from the seismometers. A white, erasable annotation plate on the lid of the metal case is provided for pencil marking seismometer locations adjacent to corresponding input terminals. When changing location of seismometer, change plate notation. Terminals for the ground wire and the headset are located on the fuse panel.

c. Each seismometer is housed in a 2-inch diameter, hermetically sealed aluminum case equipped with a 2-inch spike for insertion into the soil. The spike end of the seismometer must be down for the detector to perform properly. The top has a stress ring tie point and 18-inch leads with insulated spring clips. Within every seismometer case, a coil moves vertically inside a magnet when ground motion occurs, thereby generating minute voltages. Mechanical stops prevent damage to moving parts from excessive shock and vibration encountered in tactical use and transportation.

d. The headset has two earpieces, headband, and a connecting line with pin tips for connection to the phone terminals. The ground rod consists of an 8-inch rod equipped with a headplate and a lead to attach the rod to the control set.

W–2. Characteristics

a. The seismic intrusion detector is intended to provide a warning of intrusion into a specific area without the intruder being aware of detection. The system is capable of detecting any movement which results in a minute earth movement. such a movement can be caused by human footsteps, moving vehicles, low-flying or taxi-ing aircraft, or any similar disturbances. The seismometer may be submerged to detect marine movements. Movements in underground tunnels are detected at the same range as surface movements. Movements inside structures, such as buildings are detected through vibrations in the structure members; however, buildings in which there is a quantity of moving, machinery becomes too noisy for good detection.

b. Conditions existing at the time of use—such as type of terrain, wind, degree of disturbance caused by the intruder, and interfering friendly disturbances—will have some effect on the range. The control set may be placed up to 1 mile from the seismometer without affecting range within limitations described above.

(1) Range—30 yards (ordinary use measured in all directions from the seismometer).

(2) Batteries—Six BA–30, 1.5V.

(3) Ambient Temperature Range—0° F to 150° F.

(4) Altitude.

(*a*) Transporting—35,000 feet.

(*b*) Operating—10,000 feet.

(5) Connecting Wire — Standard 2-conductor field wire or equivalent 18-gage commercial wire suitable for field telephone use. Loop resistance to one seismometer should not exceed 50 ohms (normally 1 mile of field wire) for peak performance.

W–3. Reference

TM 11–6655–202–15.

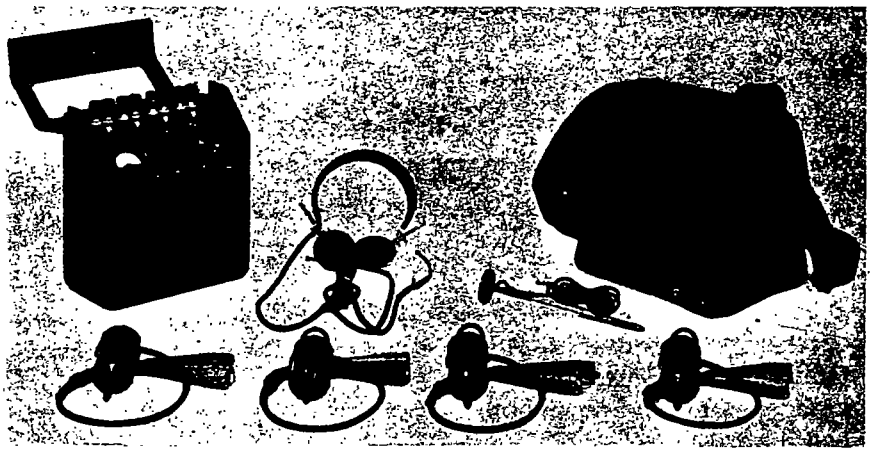


Figure W–1. Detecting set, intrusion, AN/PSR–1.

APPENDIX X

PHOTOGRAPHIC SURVEILLANCE SYSTEM, AIRBORNE, KS–61A

X–1. Description and Capability

Photographic Surveillance System KS–61A (fig. X–1) is a complete system designed to photograph the ground terrain and provide photographic terrain maps. This system can be used for both day and night aerial photography. The KS–61A system includes one camera, still picture KA–30A, as the basic photographing device along with various electrical, electronic, and mechanical components (in addition to the KA–30A) control the operation and position of the KA–30A. The camera is positioned by the system to provide vertical or oblique photographs of the terrain. Camera exposure, shutter speed, and shutter operation are controlled by the system. The shutter can be operated manually for single exposures by the pilot or observer or automatically by the system for a series of accurately timed and spaced photographs. The system also provides image motion compensation which moves the film in the camera at the same rate as the image during exposure. This eliminates smear of the picture caused by aircraft forward motion. The exposure rate or shutter operation rate in automatic is set for a 60 percent overlap of succeeding pictures. This causes vertical pictures to provide a three-dimensional rendering of the ground terrain as in stereophotography. The system also includes a flare ejection and timing system that ejects flares for ground illumination during night photography missions. The KS–61 system less the KA–30A is installed in all models and configurations of the Mohawk OV–1 aircraft. The KA–30A is issued to the using organization for installation in the Mohawk.

X–2. Federal Stock Number

Federal Stock Number 6720–897–5847.

X–3. Reference

TM 11–6720–208–12.

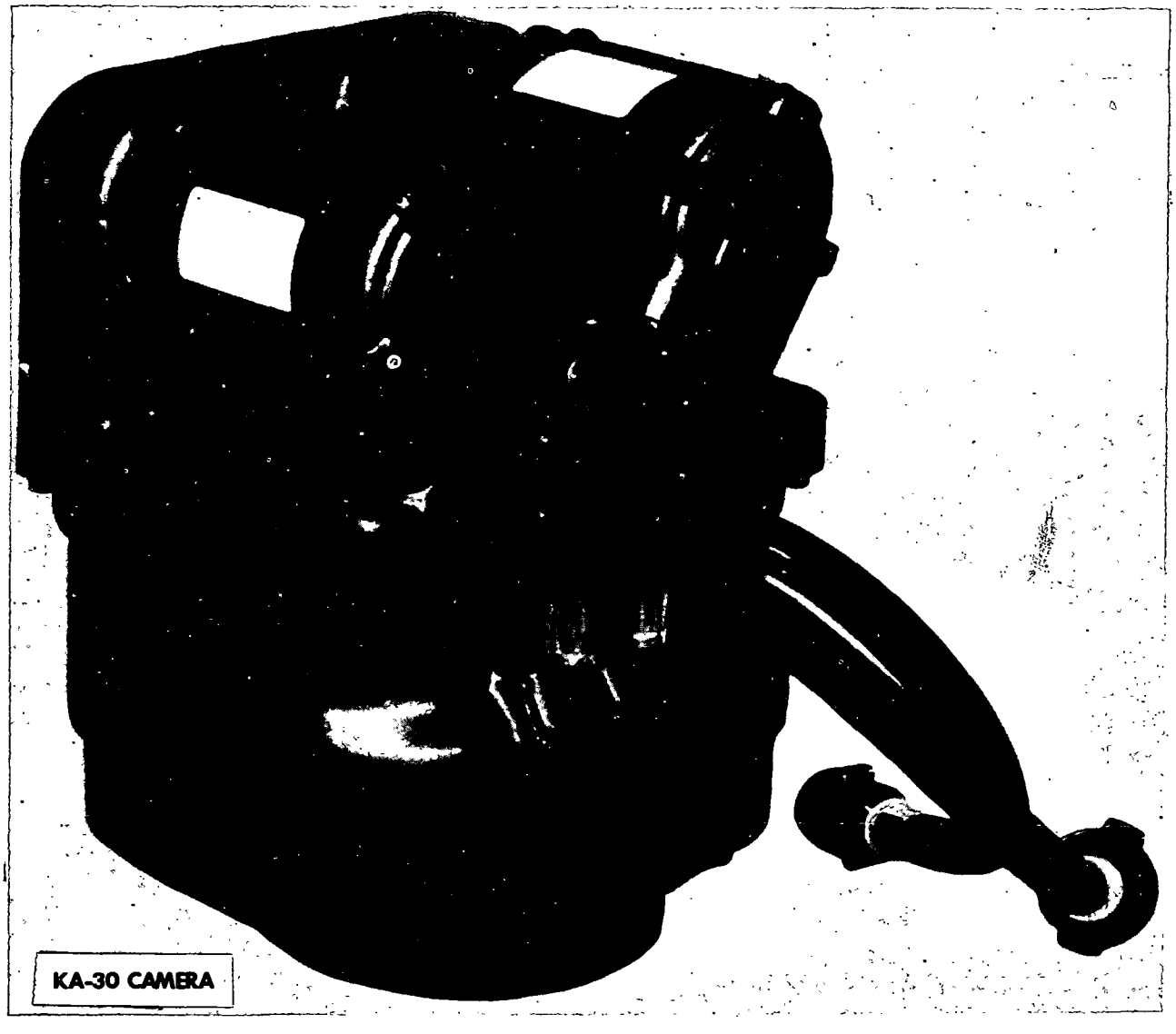


Figure X–1. Photographic surveillance system, airborne KS–61A.

APPENDIX Y

15–INCH SEARCHLIGHT (TANK MOUNTED)

Y–1. Description and Use

Also known as the Supplementary Invisible Vehicular Searchlight, the 15″ searchlight is a medium size, one KW Xenon searchlight with a 50 million peak beam candlepower and one degree or seven degrees beamspread. It is capable of operating as either a white light or infrared searchlight. It weighs 50 pounds and was designed for mounting on the M551 (Sheridan) vehicle (fig. Y–1).

Y–2. Additional Details

Additional details will be published when available.

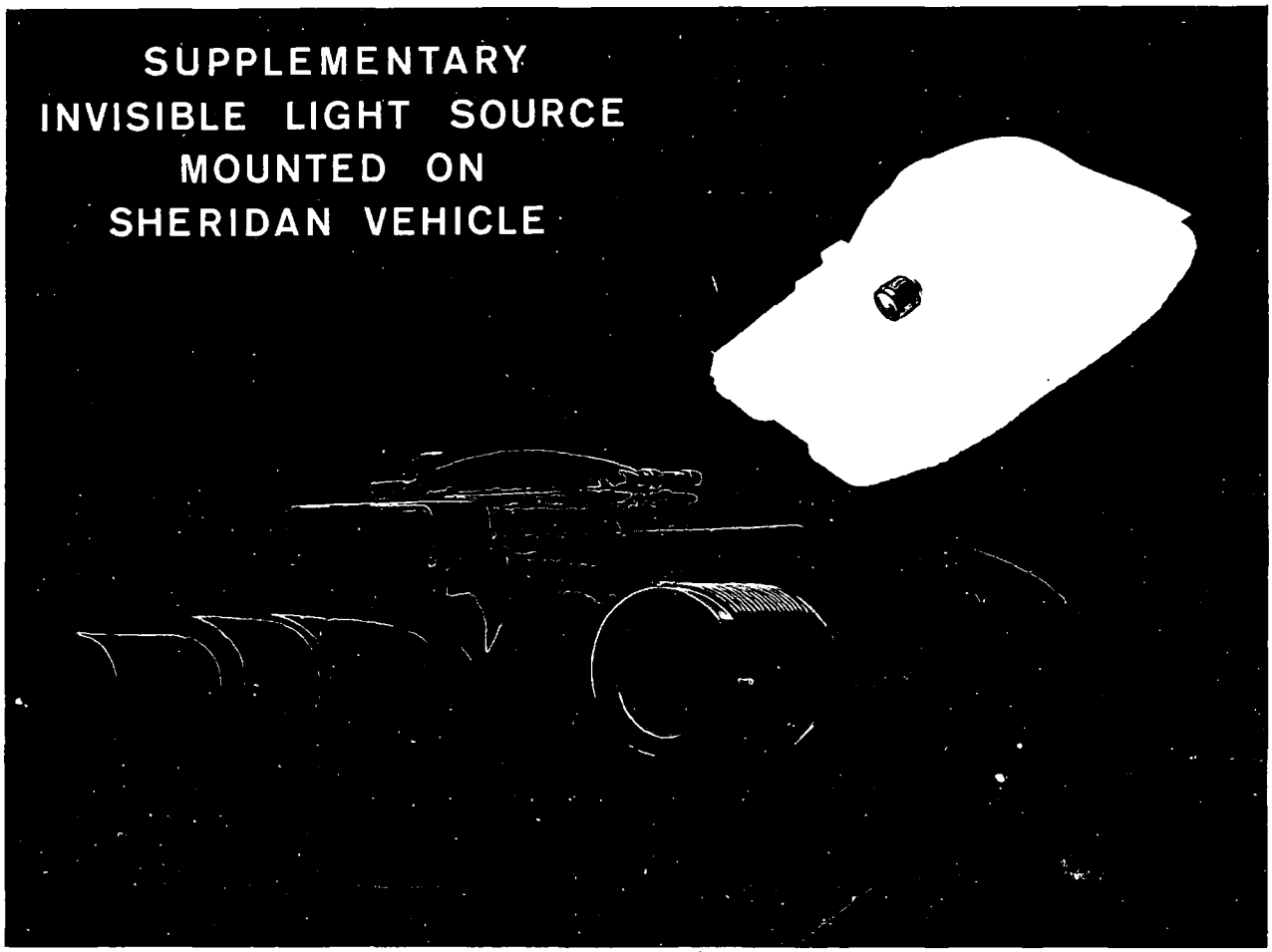


Figure Y–1. 15-inch searchlight.

APPENDIX Z

PERISCOPE, TANK GUNNER'S, XM50

Z–1. Description and Use

The periscope, tank gunner's, XM50, is a major component of the fire control system of the M60A1E1/E2 main battle tank (fig. Z–1) and serves as the primary fire control instrument for the conventional round for both day and night operation. The XM50 consists of five major subassemblies, as follows:

a. Head assembly.
b. Upper body assembly.
c. Lower body assembly.
d. Recticle projector.
e. Tube assembly.

The periscope mounted in the turret on the right side of the main gun, with the entrance window forward. The guard and shield assembly is used to mount the periscope in the turret.

Z–2. Characteristics

a. Weight—207 pounds (approximately).
b. Size.
  (1) Width—9 inches.
  (2) Overall height—28 inches.
  (3) Maximum depth—14½ inches.
  (4) Offset Line-of-sight—16½ inches.
c. Optical Characteristics (Night).
  (1) Magnification—10X.
  (2) Field of View—5½°.
d. Line of Site Travel.
  (1) Elevation—22°.
  (2) Depression—18°.

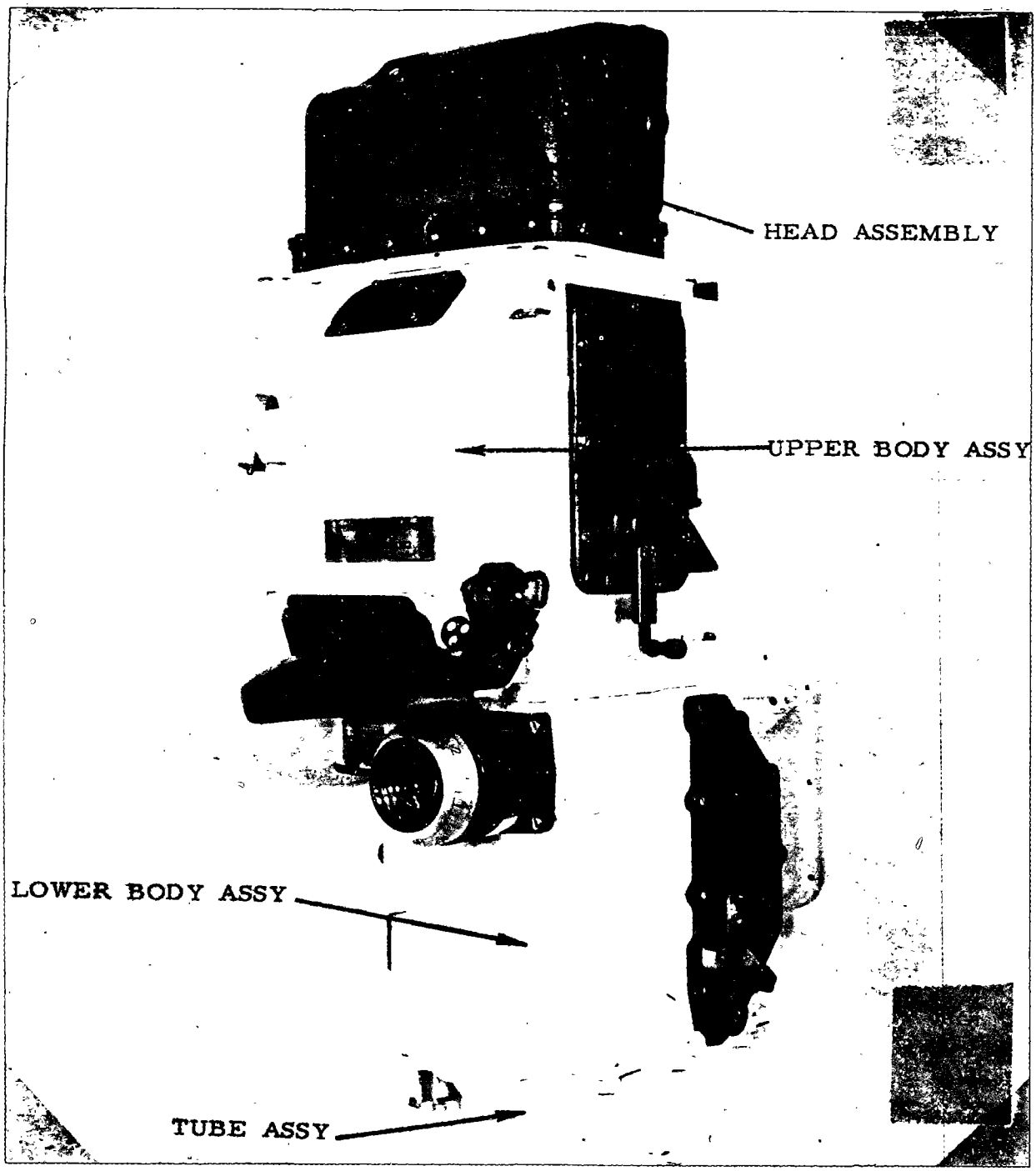


Figure Z–1. Periscope, tank gunner's, XM50.

APPENDIX AA

PERISCOPE, TANK COMMANDER'S, XM51

AA-1. Description and Use

The Tank Commander's Periscope, XM51 (fig. AA-1), in conjunction with the XM19 ballistic computer, is one of the primary fire control instruments employed in the M60A1E1 Main Battle Tank when the conventional round is fired. The periscope is also employed by the commander to align the target when firing the .50 caliber machinegun mounted in the cupola, and can also be used to aim and fire the 7.62-mm coaxial machinegun. The mirror in the periscope is electrically linked to the major weapon and mechanically linked to the commander's machinegun. The periscope can be used for both night and day operation. The periscope XM51 consists of four major subassemblies, as follows:

a. Head assembly.
b. Body assembly.
c. Tube assembly.
d. The reticle projector assembly.

The periscope is mounted in the cupola by means of the guard and shield assembly.

AA-2. Characteristics

a. Weight—334 pounds (approximately).
b. Size.
  (1) Width—16 inches.
  (2) Overall height—22¾ inches.
  (3) Maximum depth—14 inches.
  (4) Offset line of sight—14 inches.
c. Optical Characteristics (Night).
  (1) Magnification—10X.
  (2) Field of View—5½°.
d. Line of Sight Travel.
  (1) Elevation—62½°.
  (2) Depression—17½°.

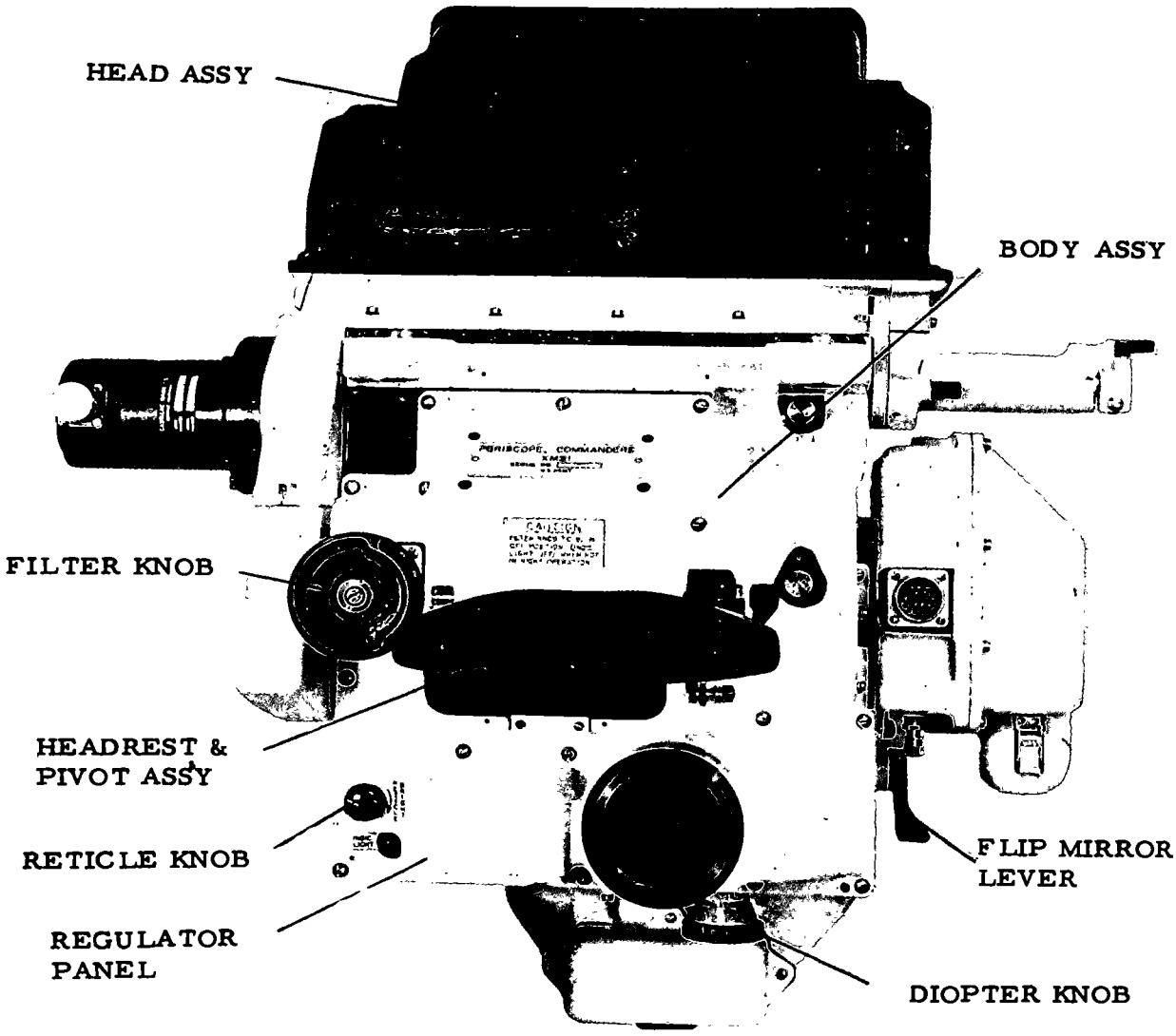


Figure AA–1. Periscope, tank commander's, XM51.

APPENDIX AB

PERISCOPE, TANK GUNNER'S, XM44

AB–1. Description and Use

a. General. The XM44 Periscope (fig. AB–1) is the night sight for the Sheridan Tank when using conventional ammunition. The XM44 periscope is mounted in the turret on the right side of the main gun.

b. Major Assemblies.

(1) The head assembly provides a large aperture and the means of elevating and depressing the field of view.

(2) The body assembly houses a large aperture optical system, an image intensifier tube, and an optical system to view the tube screen.

(3) A recticle projector system to superimpose a ballistic reticle pattern on the target image, and a unity power optical system provide for direct "daylight" viewing.

c. Accessory Equipment.

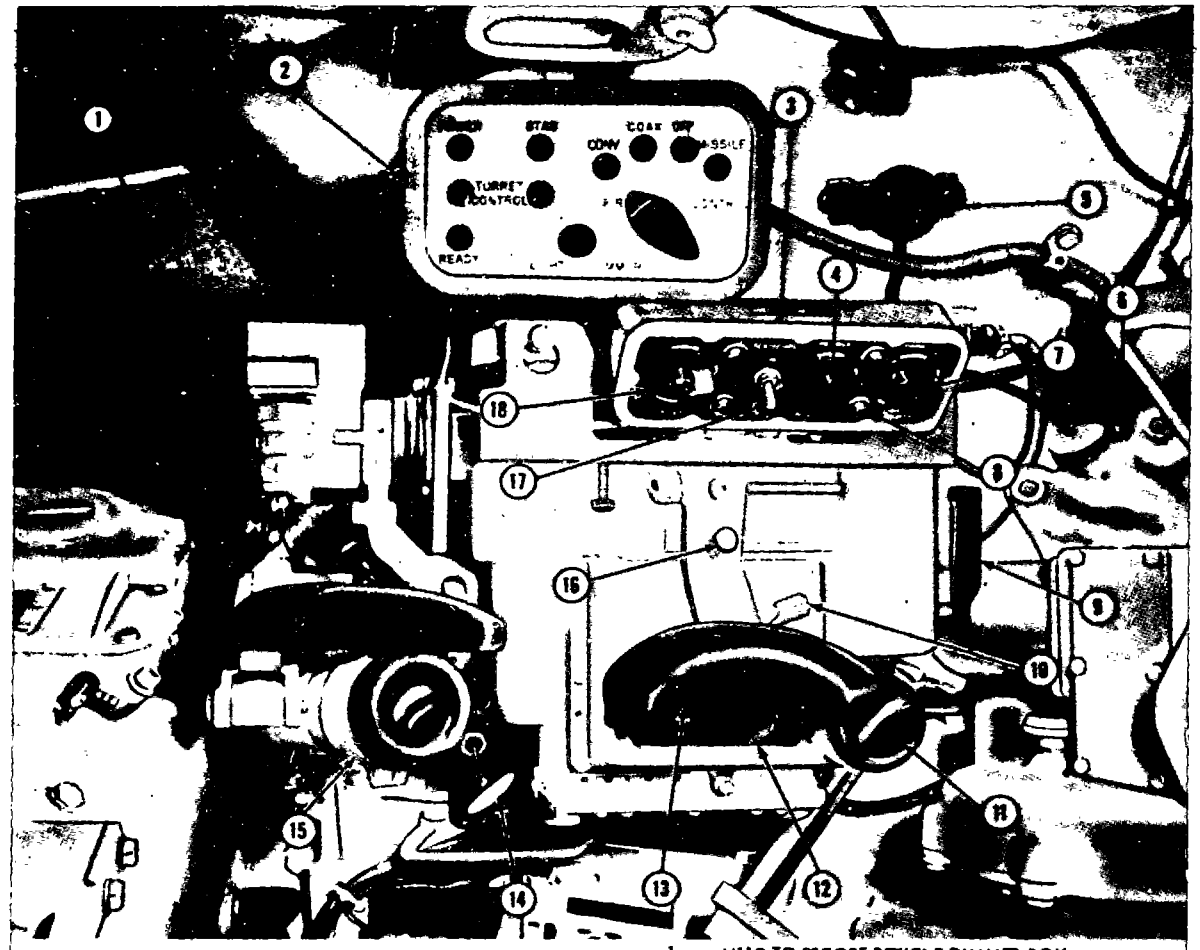
(1) The mounting plate assembly.

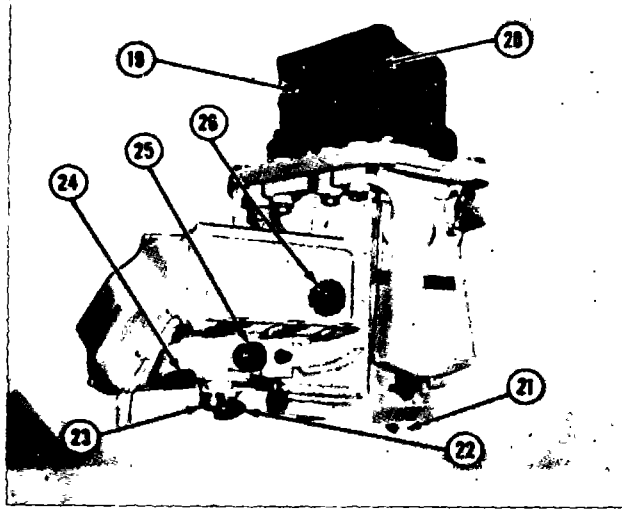
(2) The splash plate and headset assembly.

(3) The guard and shield assembly.

AB–2. Characteristics

a. Magnification—9X.
b. Field of View—6°.
c. Temperature range— −65° F to + 160 F.
d. Line of sight travel.
  (1) Elevation—22°.
  (2) Depression—18°.
e. Field of View.
  (1) Horizontal—22°.
  (2) Vertical—8°.
f. Weight—134 pounds.
g. Size.
  (1) Width—13 inches.
  (2) Overall height—21⅛ inches.
  (3) Effect line of sight—14.7 inches.





1. M119 TELESCOPE RETICLE DIMMER BOX
2. GUN AND TURRET CONTROL SELECTOR
3. XM44 PERISCOPE CONTROL PANEL
4. RETICLE RHEOSTAT KNOB
5. WINDOW WASHER PLUNGER
6. WINDOW WASHER FLUID RESERVOIR
7. CONTROL PANEL LIGHT RHEOSTAT KNOB
8. CONTROL PANEL INDICATOR LIGHT (4)
9. BALLISTIC GUARD CONTROL HANDLE
10. HEADREST (POSITIONING) LOCKING HANDLE
11. EYEPIECE
12. EXIT WINDOW UNITY SYSTEM
13. HEADREST
14. TRANSMITTER DOOR CONTROL HANDLE
15. M119 TELESCOPE
16. HEADREST HORIZONTAL ADJUSTING SCREW
17. PERISCOPE "ON/OFF" SWITCH
18. WINDOW WASHER RHEOSTAT KNOB
19. WINDOW
20. WINDOW WASHER
21. FILTER LEVER
22. DIOPTER KNOB
23. ELEVATION BORESIGHT KNOB
24. RETICLE PROJECTOR HOUSING
25. AZIMUTH BORESIGHT KNOB
26. FOCUS KNOB

WE 10948

Figure AB–1. Periscope, tank gunner's, XM44.

APPENDIX AC
MINISCOPE

AC–1. Description

The miniscope (fig. AC–1) is a night vision device for visual observation and aimed fire of weapons at night. The device is capable of being employed as a handheld viewer or weapon mounted sight on basic infantry weapons.

AC–2. Additional Information

Additional information will be published when available.

Figure AC–1. Miniscope.

APPENDIX AD
RANGEFINDER, LASER, M-23

AD–1. Description and Use

The M–23 Laser (fig. AD–1) will provide the forward observer with precise polar plot data in the form of azimuth, vertical angle, and distance. The Laser technique involves the determination of range by measuring the transit time of a ray of light beamed to a target and reflected back to the rangefinder, achieving a reading accurate enough to bring to reality the artillery ideal of "first round fire for effect."

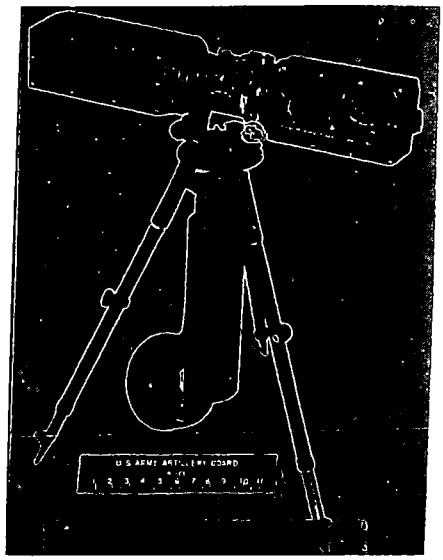


Figure AD–1. Rangefinder, Laser M–23.

AD–2. Federal Stock Number

Federal Stock Number 1240–921–5538.

AD–3. Reference

a. TM 9–1240–316–14.
b. TM 9–1240–316–20P.

APPENDIX AE

PERISCOPE, TRACKED VEHICLE DRIVER'S, INFRARED, M24

AE–1. Description and Use

The M24 periscope (fig. AE–1) is an infrared viewing device of the binocular type used in night driving of tanks. Invisible infrared rays are projected forward from headlamps at the bow of the vehicle to illuminate the field of view. The periscope converts the infrared image to a visible image which is viewed through conventional lenses. The power supply unit, which is contained in the vehicle, provides all power for operation of the periscope.

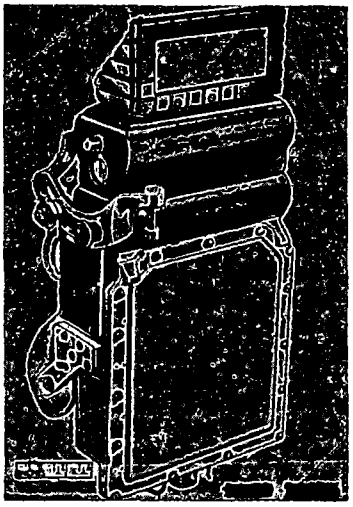


Figure AE–1. Periscope, tracked vehicle driver's, infrared, M24.

AE–2. Characteristics

a. Depth—6 inches.
b. Width—8¼ inches.
c. Height—18½ inches.
d. Weight—16 pounds.
e. Magnification—1 power.
f. Field of view—26.8°.
g. Focal point—18–20 yards.

AE–3. Reference

TM 9–2350–206–12.
TM 21–306.

APPENDIX AF

PINK FILTER FOR THE 23-INCH XENON SEARCHLIGHT

AF–1. Description and Use

The standard 23-inch Xenon searchlight (fig. E–1) may be modified to provide illumination to extend the range of passive vision devices. This modification consists of replacing the near infrared filter with a filter that permits passage of some visible light frequencies. The range of frequencies that will pass through this filter lie between the visible and infrared frequencies. The effect on the target area cannot be detected by the unaided eye. Use of an image intensification device, however, will intensify this illumination and add greatly to the range of the device.

AF–2. Additional Information

Additional information will be published when available.

APPENDIX AG
NIGHT VISIBILITY PLAN (NVP)

To be published.

GLOSSARY

Active vision devices—An item of optical equipment which requires energy projected from a manmade source to provide an image to the user.

Aerial rocket artillery—A direct air-to-ground rocket subsystem capable of the delivery of a large volume of fire for area coverage, or a direct air-to-ground missile subsystem capable of destroying point targets. The subsystems are mounted on attack helicopters under the control of artillery elements.

Ambient light—All light available from natural sources.

Anti-intrusion devices—Safeguards used to alert security personnel to an impending or attempted intrusion into a secured area.

Armed helicopter—Any helicopter that has a mounted weapon or weapons system which is intended primarily for offensive purposes. It does not include aircraft armed solely for self-protection with a primary mission of other than armed engagements.

Artificial daylight—Illumination of an intensity greater than the light of a full moon on a clear night.

Artificial illumination—Any manmade or man-generated illumination.

Attack helicopter—An armed helicopter modified or designed to search out, attack, and destroy enemy targets, and supplement the fires of ground based weapons. This includes armed helicopters configured to perform escort, antimechanized, and direct fire support missions.

Base defense—The local military measures, both normal and emergency, required to nullify or reduce the effectiveness of enemy attacks on, or sabotage of, a base in order to insure that the maximum capacity of its resources are available to the defending forces.

Base of observation, illumination, and fire (BOIF)—Elements that maintain direct and overwatching observation of known or suspected enemy positions to provide supporting fires, target acquisition, and battlefield illumination for the attacking force.

Battlefield illumination—The lighting of the zone of action of ground combat and combat support troops by artificial means other than invisible rays.

Conditional lines of deployment (CLD)—A line(s) previously selected on the ground that is utilized to control a mounted force conducting an attack in depth (e.g. a night exploitation) under conditions of limited visibility before reaching the probable line of deployment. The line(s) is usually located on a clearly defined terrain feature perpendicular to the direction of attack where the force can rapidly deploy for engagement prior to reaching the probable line of deployment. Lines are usually spaced closer together than phase lines.

Detection—An indication of the presence of a target of potential military interest in a reasonable time, but without recognition of the object.

Diffusion—Illumination of the area beneath and to the flanks of a slightly elevated searchlight beam by the light scattered from atmospheric particles.

Direct illumination—A type of battlefield illumination provided by direct light from pyrotechnics or searchlights.

Far infrared—That portion of the electromagnetic spectrum of longer wavelength than the near infrared portion. This radiation is characteristic of that emitted by objects warmer than their surroundings.

Final coordination line (Final CL)—A line close to the enemy position used to coordi-

nate the lifting and shifting of supporting fires with the final deployment of maneuver elements. It should be recognizable on the ground.

Flicker illumination—A method in which constant illumination is maintained in an area by searchlights from multiple locations. The duration of each flicker is 5 to 15 seconds. During the period one searchlight is flicked off, other searchlights are flicked on so that constant illumination is provided in the area.

Heavy overcast conditions—Illumination on the order of 10^{-5} foot-candles.

Identification—Discrimination between targets (objects) within a class, e.g., M60 tank, T54 tank.

Indirect illumination—A type of battlefield illumination obtained by employing searchlights using diffusion or reflection techniques.

Infrared light source—Light from which the invisible portion of the spectrum has been removed by the use of special filters.

Invisible illumination—Any illumination not visible to the unaided eye.

Light line—A designated line forward of which vehicles are required to use blackout lights at night.

Line of observation and surveillance (LOS)—A line of positions established within the security echelon equipped with night operating aids to maintain observation and surveillance over the enemy during periods of limited visibility.

Moonlight conditions—Illumination on the order of 10^{-2} foot-candles.

Near infrared—That portion of the electromagnetic spectrum which is adjacent to, or "near" the visible light portion. It includes that portion of the infrared spectrum from about 0.85 micron to 1.2 microns in wavelength; the lower limit being approximately that of visible light, the upper limit being that of the cutoff point for the near infrared photoemissive surface presently available.

Night operations—All military activities (attack, defense, movement, combat support, and combat service support) that are conducted at night, or during other conditions which tend to limit visibility, such as rain, fog, snow, artificial screening agents, or dust (particularly that created by nuclear detonations).

Night operating aids—A composite group of aids to include all passive and active night vision devices, surveillance devices, and navigation aids available to a particular unit for an operation. These aids vary between units according to the type unit and specific missions.

Night visibility plan (NVP)—A plan which coordinates the use of all night vision aids and surveillance devices available to a unit which will be employed in a night operation. It reflects the commanders concept of how these aids will be employed.

Observation and security group (O&S)—A security element established by the frontline units equipped with night operating aids to provide early warning of the enemy approach and cause the enemy to deploy prematurely.

Passive vision device—An item of optical equipment which requires only available ambient energy to provide an image to the user.

Probable line of deployment (PLD)—A line previously selected on the ground where attacking units deploy prior to beginning an assault under conditions of limited visibility.

Recognition—Discrimination between targets (objects) as to class, e.g., tank, truck, gun.

Reflection—Illumination of an area by reflection of a searchlight beam from low-lying clouds.

Starlight conditions—Illumination on the order 10^{-4} foot-candles.

Surveillance—The systematic observation of air, surface, or subsurface areas by visual, electronic, photographic, or other means for intelligence purposes.

Visible illumination—Any illumination visible to the unaided eye.

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